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United States
Department of
Agriculture

Soil
Conservation
Service

Bozeman,
Montana



Montana Water Supply Outlook

May 1, 1987



MONTANA
1515 1/2 6000
HELENA, MONTANA 59202
2700



Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado	2490 West 26th Ave., Denver, CO 80211
New Mexico	517 Gold Ave. S.W., Room 3301, Albuquerque, NM 97102
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	1201 Terminal Way, Room 219, Reno, NV 89502
Oregon	1220 Southwest 3rd Ave., Room 1640, Portland, OR 97208
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82601

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Environment Technical Services Division, 9820 106th St., Edmonton, Alberta T5K 2J6.

Montana Water Supply Outlook

and

Federal – State – Private Cooperative Snow Surveys

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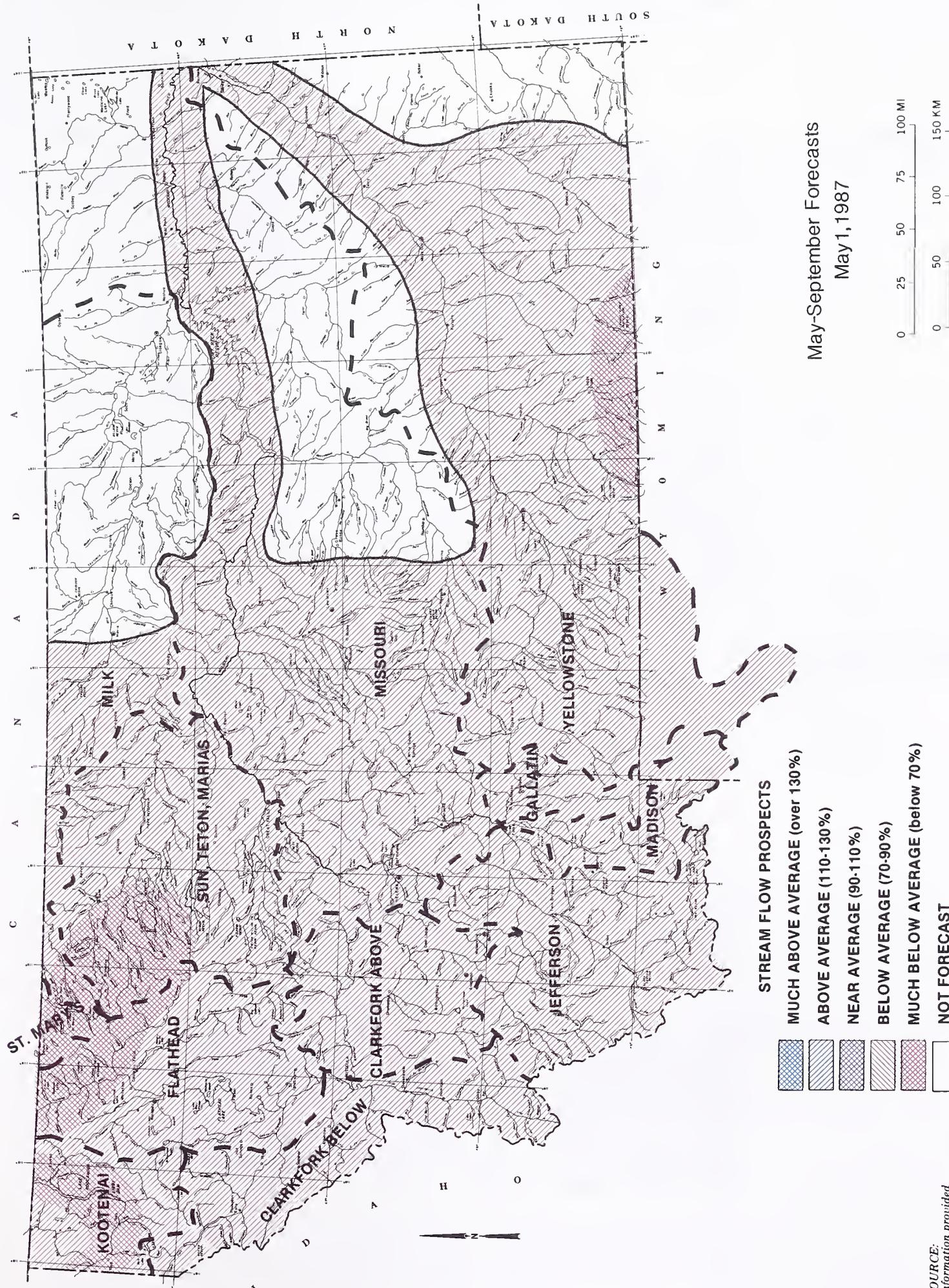
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GENERAL OUTLOOK

SUMMARY:

April precipitation varied from about 25 to 80 percent of average over various drainage basins with the better moisture falling in the northwestern part of the state. Warmer than normal temperatures in April depleted the snowpack to record low levels in many areas. Snowpacks vary from about 10 to 65 percent of average across Montana with the better snowpacks residing in the northwest drainages. Streamflows resulting from earlier than usual snowmelt were above average in most drainages. However, some headwater streams in the upper Clark Fork drainage did show below average runoff as there was not enough low elevation snowpack to generate much streamflow. Warm and dry weather also caused irrigation to begin much earlier than normal. Almost all streams in the state reached their peak snowmelt runoff around the first of May. Those with higher elevation headwaters such as the Yellowstone, Gallatin and Bitterroot are expected to peak before mid-May.

SNOWPACK:

Snowpacks vary from about 50 to 65 percent of average in the Kootenai, Flathead, Marias and St. Mary drainages and generally from 20 to 40 percent of average in other drainages. About 30 percent of the snow courses set a new minimum of record for May 1 surveys while another 30 percent tied previous minimums of no snow on this date. Most areas had below average snowpacks on April 1 and the combination of low April precipitation and above normal temperatures reduced the snowpack to these very low levels. In many drainages, the current snowpack compares with snowpack in early to mid-June in a normal year.

PRECIPITATION:

All mountain areas reported below average April precipitation. The northwestern part of the state had the best moisture but was still in the 65 to 80 percent of average range. All other areas showed only 25 to 35 percent of average precipitation. In many drainages, April was the fifth consecutive month with below average mountain precipitation.

RESERVOIRS:

Nearly all reservoirs in the state have above average storage for this time of year. However, some may not fill this year unless heavy rainfall occurs. Most of those that do not fill are a result of low inflows and releases for irrigation or water rights much earlier than would occur on a "more normal" year. It appears most reservoirs will be empty or nearly empty before the end of the irrigation season.

STREAMFLOW:

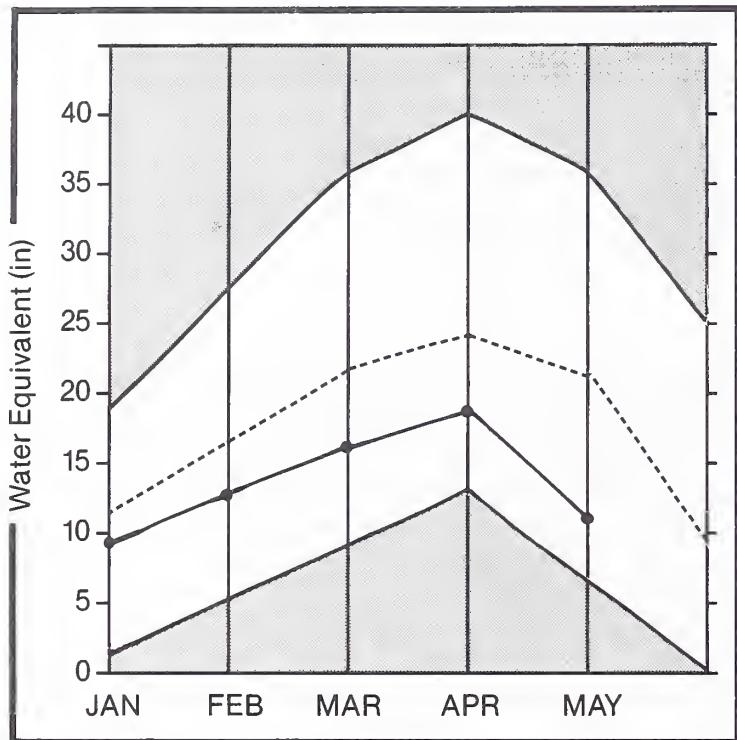
April runoff was above average on most streams. Below average runoff was recorded in central Montana, Clark Fork drainages above Missoula and on the lower Yellowstone River. Much of the season's snowpack was converted to runoff as above normal temperatures persisted most of month. Forecasts for the next five months are for below average runoff from all drainages. With the exception of northwest area streams, this year's runoff is expected to be near record lows. New record lows could be established in many drainages if May and June precipitation is below average. With higher than normal temperatures and deficient moisture, large amounts of water are being diverted for irrigation. Irrigation has started a month to six weeks ahead of normal. Most mountain soils are dry for this time of year and considerable rain will be required to generate any significant runoff.

PEAK SNOWMELT FLOWS:

A tabulation of peak snowmelt flow ranges is shown on page 32. Unless heavy rains occur later this season, the annual peak flows recorded for this season will be some of the lowest on record. Most streams reached their peak snowmelt runoff around the first of May. Some of the peak flows were so low that they were almost unnoticed on some drainages. Streams with higher elevation headwaters such as the Yellowstone, Gallatin and Bitterroot are all expected to have their peak snowmelt runoff before mid-May.

Kootenai Basin

Mountain snowpack* (inches)

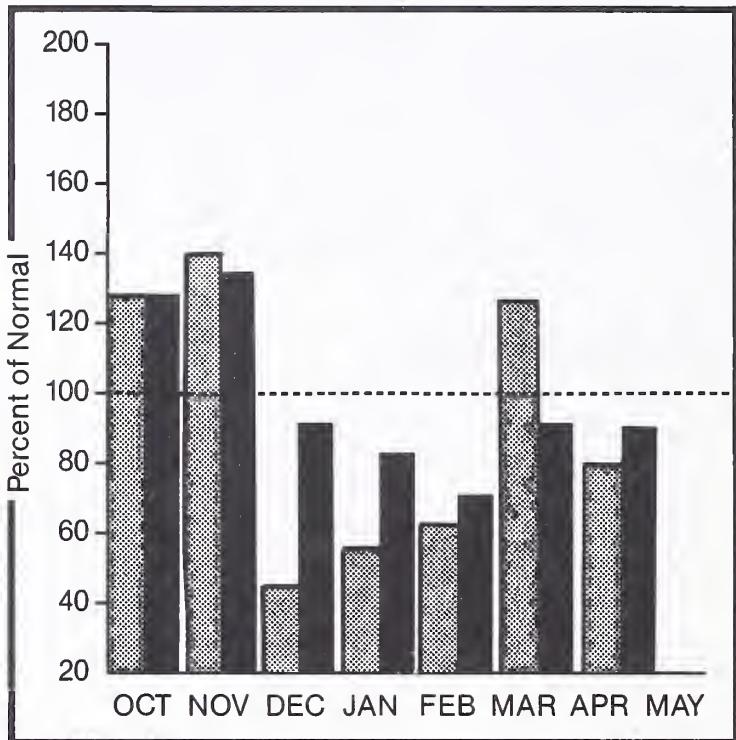


*Kootenai in Montana

Maximum Average

Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WATER SUPPLY OUTLOOK:

Above normal temperatures and below average mountain precipitation has caused snowpack percentages to decrease. Currently, the water stored in the snowpack is about 60 percent of average. Snow in the British Columbia area is better than in Montana. April runoff was a little above average on Montana tributaries and about 140 percent of average on the Kootenai River. Streamflows for the next 5 months are forecast to be well below average on all drainages. Snowmelt peaks which are well below average have already occurred on Montana tributaries.

For more information contact your local Soil Conservation Service office.

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR, AVG.	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
KOOTENAI RIVER b/w Libby Dam 2	MAY-JUL	5438.0	4350.0	80	5270.0	97	3430.0	63
	MAY-SEP	6456.0	5230.0	81	6330.0	98	4130.0	64
FISHER RIVER near Libby	MAY-JUL	173.0	105.0	61	155.0	90	55.0	32
	MAY-SEP	189.0	115.0	61	170.0	90	60.0	32
YAAK RIVER near Troy	MAY-JUL	391.0	220.0	56	315.0	81	125.0	32
	MAY-SEP	414.0	230.0	56	330.0	80	130.0	31
KOOTENAI RIVER at Leonia 2	MAY-JUL	6585.0	4950.0	75	6200.0	94	3700.0	56
	MAY-SEP	7685.0	5850.0	76	7310.0	95	4390.0	57

RESERVOIR	RESERVOIR STORAGE (1000AF)			WATERSHED	WATERSHED SNOWPACK ANALYSIS			
	USEABLE CAPACITY	** USEABLE STORAGE **			NO. COURSES	THIS YEAR AS % OF		
		THIS YEAR	LAST YEAR			Avg'D	LAST YR. AVERAGE	
LAKE KOOCANUSA	5748.0	2712.0	2583.0	1932.0	EAST KOOTENAI in B.C.	28	80 72	
					KOOTENAI in MONTANA	32	88 51	
					KOOTENAI ab BONNERS FERRY	59	82 58	

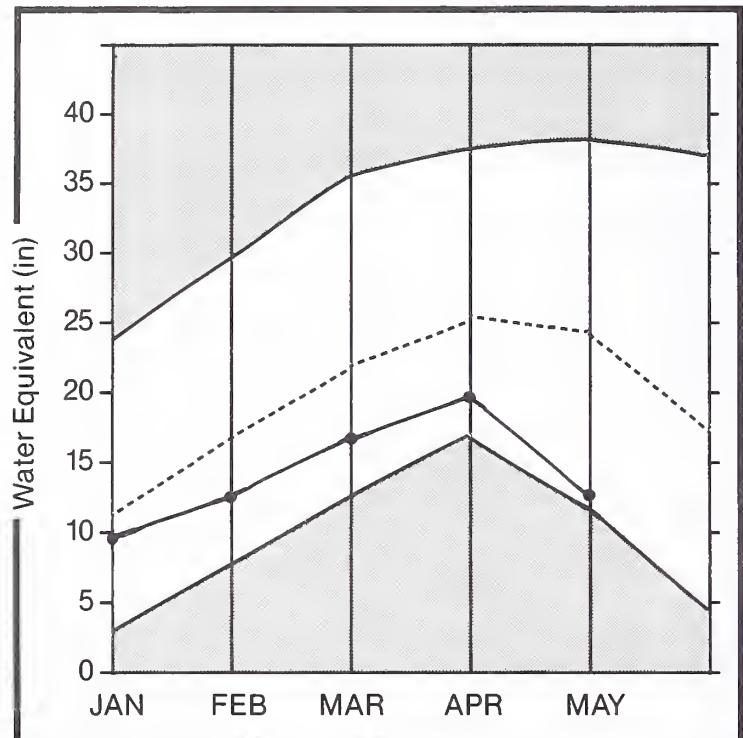
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2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Flathead Basin

Mountain snowpack* (inches)



*Flathead

Maximum



Average



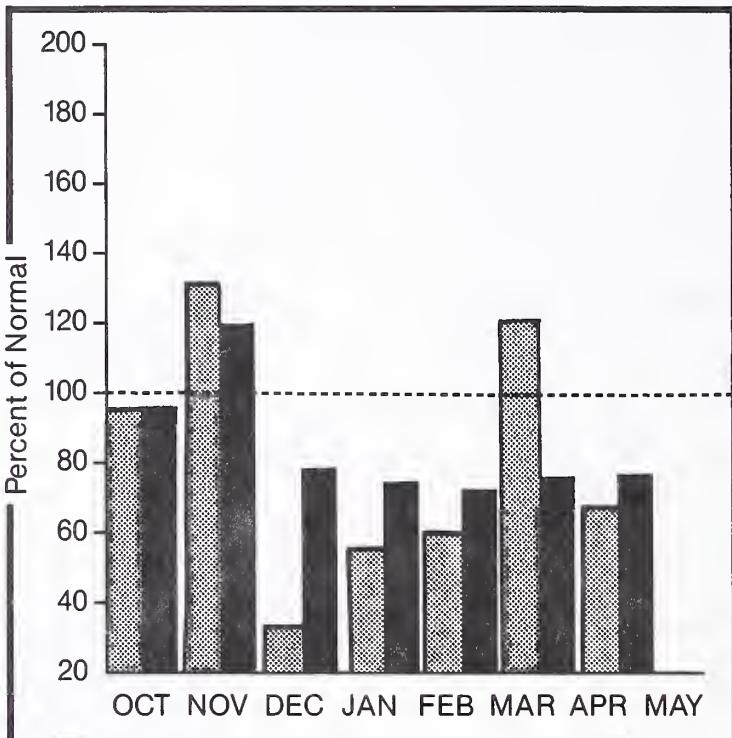
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WATER SUPPLY OUTLOOK:

April temperatures were above average while mountain precipitation was only about 65 percent of average. This combination has reduced the snowpack water content to about one-half the amount normally expected at this time of the year. April runoff was well above average. Streamflow forecasts for the remainder of the spring and summer are for well below average volumes. The peak snowmelt runoff occurred in early May and was well below average. Irrigation water supplies from streams not having stored water will be in short supply by early June unless precipitation patterns change toward better moisture conditions.

For more information contact your local Soil Conservation Service office.

FLATHEAD RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
NF FLATHEAD near Columbia Falls	MAY-JUL	1528.0	1120.0	73	1380.0	90	860.0	56
	MAY-SEP	1708.0	1280.0	75	1570.0	92	990.0	58
MF FLATHEAD near West Glacier	MAY-JUL	1513.0	1090.0	72	1380.0	91	800.0	53
	MAY-SEP	1669.0	1220.0	73	1520.0	91	920.0	55
SF FLATHEAD near Columbia Falls 1	MAY-JUL	1861.0	1240.0	67	1560.0	84	925.0	50
	MAY-SEP	1998.0	1350.0	68	1670.0	84	1030.0	52
FLATHEAD near Columbia Falls 1	MAY-JUL	5016.0	3550.0	71	4400.0	88	2700.0	54
	MAY-SEP	5518.0	3950.0	72	4830.0	88	3070.0	56
SWAN RIVER near Big Fork	MAY-JUL	509.0	290.0	57	380.0	75	200.0	39
	MAY-SEP	595.0	345.0	58	450.0	76	240.0	40
FLATHEAD RIVER near Polson 2	MAY-JUL	5834.0	4110.0	70	5040.0	86	3180.0	55
	MAY-SEP	6398.0	4550.0	71	5700.0	89	3400.0	53

RESERVOIR	RESERVOIR STORAGE (1000AF)			WATERSHED SNOWPACK ANALYSIS				
	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
	THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE	
CAMAS (4)	45.2	30.4	36.0	28.4	NORTH FORK FLATHEAD	15	102	63
MISSION VALLEY (8)	100.0	46.4	61.5	49.7	MIDDLE FORK FLATHEAD	11	75	52
HUNGRY HORSE	3451.0	2665.0	2729.0	2040.0	SOUTH FORK FLATHEAD	12	62	46
FLATHEAD LAKE	1791.0	944.8	944.8	929.0	STILLWATER-WHITEFISH	9	86	50
					SWAN	10	67	51
					LITTLE BITTERROOT	6	19	8
					FLATHEAD	43	76	52

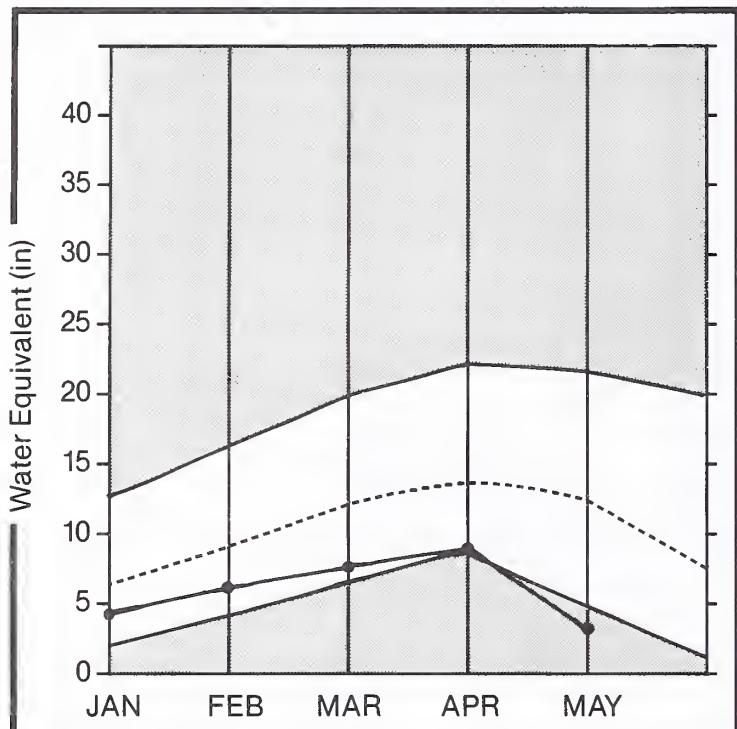
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Clark Fork Basin above Missoula

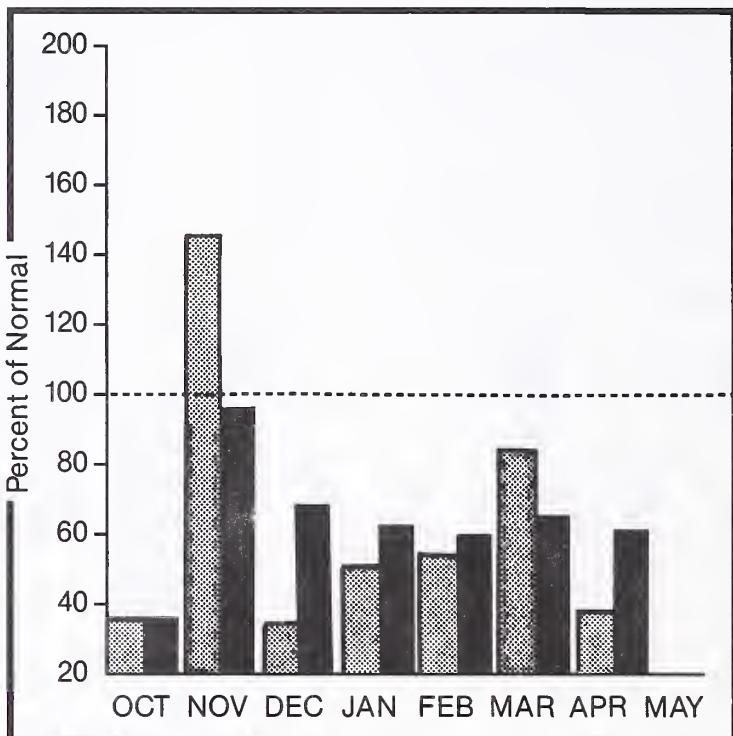
Mountain snowpack* (inches)



*Clark Fork above Missoula

Maximum Average
Minimum Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation Year to date precipitation

WATER SUPPLY OUTLOOK:

Below average mountain precipitation and above average temperatures during April have depleted the below average snowpack to even lower levels. This is the fifth consecutive month of below average precipitation. Currently, the water stored in the snowpack is only 30 percent of levels usually expected for this time of the year. Many snow courses reported new record low water contents for May 1. April runoff was below average. Streamflows for the next five months are forecast to be only 50 to 60 percent of average. All streams had reached their snowmelt peak by early May at well below average flows. Shortages of irrigation water are expected to be widespread by early June.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG, (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX, (1000AF)	REAS. MAX, (% AVG.)	REAS. MIN, (1000AF)	REAS. MIN, (% AVG.)
MOULTON RESERVOIR Inflow (MG)2	MAY-JUN	197.0	109.0	55	160.0	81	60.0	30
	MAY-JUL	222.0	120.0	54	175.0	79	65.0	29
WARM SPRINGS at Meyers Dam 2	MAY-JUL	35.0	18.8	54	28.0	80	14.0	40
	MAY-SEP	44.0	24.0	55	35.0	80	22.0	50
FLINT CREEK near Southern Cross 2	MAY-JUL	13.4	6.1	46	11.0	82	4.0	30
	MAY-SEP	16.4	7.9	48	14.0	85	5.0	30
FLINT CREEK below Boulder Creek 2	MAY-JUL	54.0	27.0	50	46.0	85	23.0	43
	MAY-SEP	70.0	37.0	53	62.0	89	31.0	44
LOWER WILLOW CR RES Inflow 2	MAY-JUL	12.5	3.1	25	7.0	56	2.0	16
	MAY-SEP	13.4	3.6	27	8.0	60	2.0	15
M. FK. ROCK CRK near Philipsburg	MAY-JUL	65.0	33.0	51	48.0	74	27.0	42
	MAY-SEP	73.0	38.0	52	55.0	75	30.0	41
NEVADA CREEK near Finn	MAY-JUL	17.0	8.5	21	9.0	53	3.0	18
	MAY-SEP	18.0	8.9	22	10.0	56	3.0	17
BLACKFOOT RIVER near Bonner	MAY-JUL	760.0	420.0	55	565.0	74	275.0	36
	MAY-SEP	854.0	440.0	52	590.0	69	285.0	33
CLARK FORK RIVER above Milltown 2	MAY-JUL	597.0	360.0	60	570.0	95	180.0	30
	MAY-SEP	706.0	400.0	57	650.0	92	210.0	30
CLARK FORK RIVER above Missoula	MAY-JUL	1357.0	700.0	52	1040.0	77	360.0	27
	MAY-SEP	1560.0	815.0	52	1200.0	77	460.0	29

RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES	THIS YEAR AS % OF	LAST YR.	AVERAGE
	THIS YEAR	LAST YEAR	Avg.	Avg'd			
GEORGETOWN LAKE	31.0	29.8	27.1	24.3	CLARK FORK ab BLACKFOOT	42	32 25
LOWER WILLOW CREEK	4.9	2.8	5.0	3.1	BLACKFOOT	21	44 29
NEVADA CREEK	12.6	7.9	12.5	10.2	CLARK FORK above MISSOULA	57	35 27

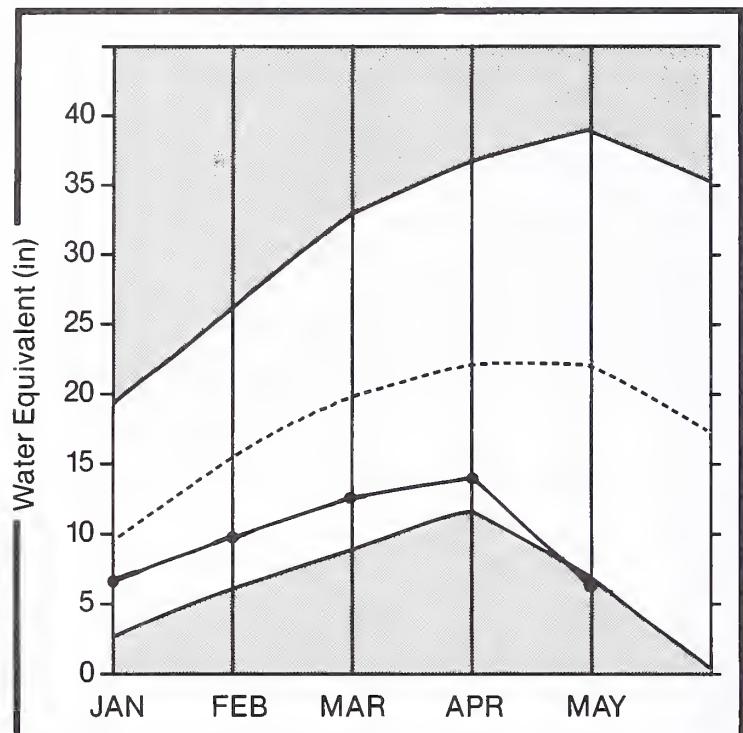
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The average is computed for the 1961-85 base period.

Clark Fork Basin below Missoula

Mountain snowpack* (inches)



*Bitterroot

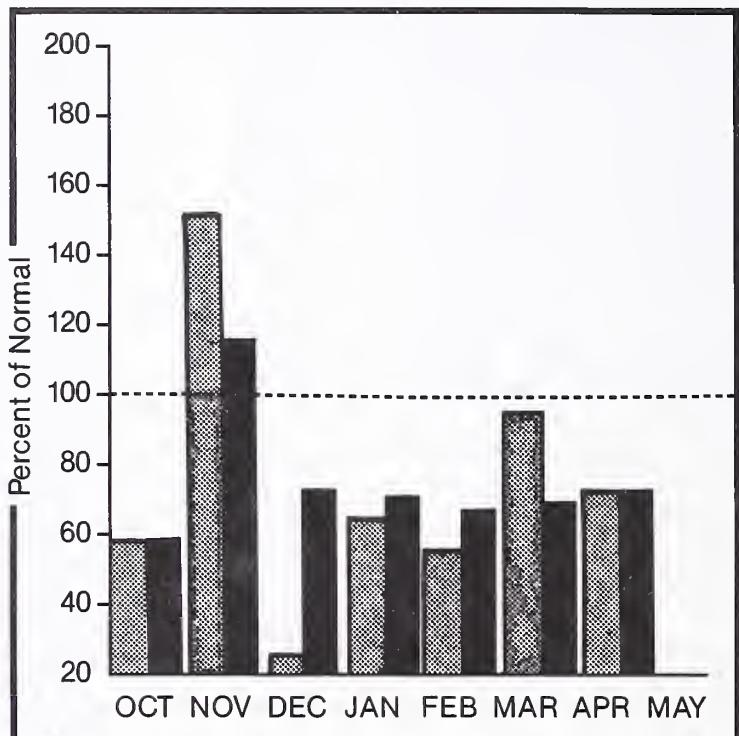
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

April mountain precipitation was only about 70 percent of average. Above average temperatures have reduced the snow levels to around 30 to 40 percent of average. Some snow courses in the Bitterroot drainage measured new record low water contents for May 1. Runoff for April was a little above average. Streamflows for the next five months are forecast to be only one-half of their average volumes. The snowmelt peak runoff occurred on most tributaries by early May and at well below average flows. Irrigation water shortages are expected to become quite common by early to mid-June.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN below Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG.	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
CLARK FORK RIVER above Missoula	MAY-JUL	1357.0	700.0	52	1040.0	77	360.0	27
	MAY-SEP	1560.0	815.0	52	1200.0	77	460.0	29
W. F. BITTERROOT RIVER nr Conner 2	MAY-JUL	135.0	65.0	48	100.0	74	50.0	37
	MAY-SEP	156.0	73.0	47	112.0	72	60.0	38
BITTERROOT RIVER near Darby	MAY-JUL	470.0	240.0	51	360.0	77	120.0	26
	MAY-SEP	519.0	260.0	50	380.0	73	220.0	42
SKALKATO CREEK near Hamilton	MAY-JUL	48.0	25.0	52	32.0	67	18.0	38
	MAY-SEP	57.0	29.0	51	36.0	63	22.0	39
BURNT FORK CR nr Stevensville 2	MAY-JUL	30.0	16.5	55	26.0	87	11.0	37
	MAY-SEP	35.0	19.1	55	28.0	80	13.0	37
BITTERROOT RIVER at Missoula 2	MAY-JUL	1239.0	560.0	45	760.0	61	360.0	29
	MAY-SEP	1354.0	625.0	46	840.0	62	460.0	34
CLARK FORK RIVER below Missoula	MAY-JUL	2586.0	1300.0	50	1770.0	68	835.0	32
	MAY-SEP	2914.0	1480.0	51	2000.0	69	955.0	33
CLARK FORK RIVER at St. Regis	MAY-JUL	3379.0	1640.0	49	2320.0	69	965.0	29
	MAY-SEP	3809.0	1880.0	49	2640.0	69	1120.0	29
CLARK FORK RIVER near Plains 2	MAY-JUL	9541.0	5860.0	61	7390.0	77	4330.0	45
	MAY-SEP	10621.0	6600.0	62	8300.0	78	4900.0	46
THOMPSON RIVER near Thompson Falls	MAY-JUL	180.0	97.0	54	140.0	78	54.0	30
	MAY-SEP	209.0	154.0	74	200.0	96	110.0	53
PROSPECT CREEK at Thompson Falls	MAY-JUL	101.0	61.0	60	80.0	79	42.0	42
	MAY-SEP	110.0	66.0	60	86.0	78	46.0	42
CLARK FORK at Whitehorse Rapids 2	MAY-JUL	10538.0	6350.0	60	7820.0	74	4880.0	46
	MAY-SEP	11764.0	7180.0	61	8710.0	74	5650.0	48

RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES	THIS YEAR AS % OF
	THIS YEAR	LAST YEAR	AVG.	Avg'D	LAST YR. AVERAGE
PAINTED ROCKS LAKE		NO REPORT	CLARK FORK above MISSOULA	57	35 27
NOXON RAPIDS	335.0	329.1	328.5	186.3	23 41 30
COMO	34.9	22.3	28.4	19.4	1 LWR CLARK FK blw MISSOULA 23 68 44
					1 BITTERROOT & LWR C.F. 44 56 39
					1 CLARK FORK TOTAL 95 48 34
					1 FLATHEAD 43 76 52
					1 PEND O'REILLE 133 59 41

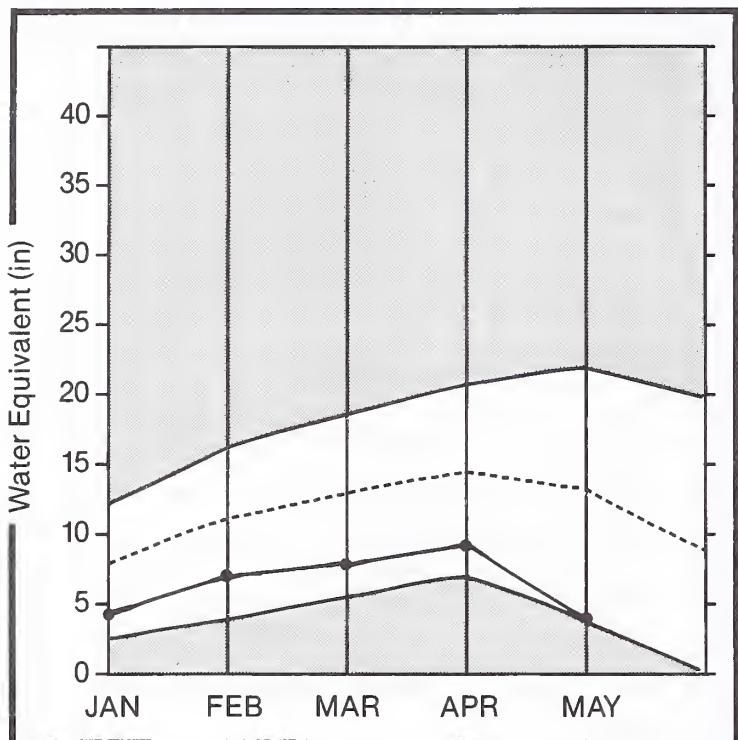
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Jefferson Basin

Mountain snowpack* (inches)



*Jefferson

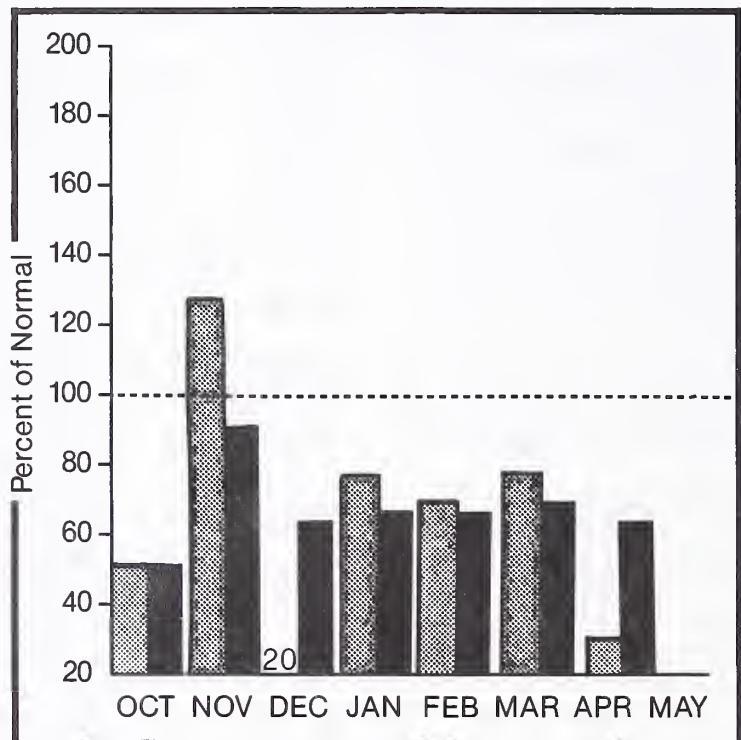
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

The snowpack is about one-third of average for this time of year. This is due to above average temperatures and mountain precipitation of only about 30 percent of average for April. This is the fifth consecutive month of below average precipitation. Some snow courses reported record low water contents for May 1. Runoff in April was near to a little above average. Streamflows for the next five months are forecast to be in the 50 to 70 percent of average range. Streamflows reached their peak snowmelt runoff near the end of April and in early May with well below average flows. On streams not having stored water, irrigation water shortages could become widespread by early to mid-June.

For more information contact your local Soil Conservation Service office.

JEFFERSON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG., (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX., (1000AF)	REAS. MAX., (% AVG.)	REAS. MIN., (1000AF)	REAS. MIN., (% AVG.)
RED ROCK RIVER near Monida 2	MAY-JUL	80.0	36.0	45	69.0	86	16.0	20
	MAY-SEP	89.0	41.0	46	78.0	88	18.0	20
BEAVERHEAD RIVER near Grant 2	MAY-JUL	109.0	40.0	37	84.0	77	20.0	18
	MAY-SEP	133.0	49.0	37	102.0	77	28.0	21
BEAVERHEAD RIVER at Barratts 2	MAY-JUL	143.0	59.0	41	116.0	81	7.0	5
	MAY-SEP	175.0	72.0	41	142.0	81	10.0	6
RUBY RIVER near Alder	MAY-JUL	75.0	52.0	69	69.0	92	36.0	48
	MAY-SEP	92.0	64.0	70	86.0	93	42.0	46
BIG HOLE RIVER near Melrose	MAY-JUL	612.0	295.0	48	480.0	78	195.0	32
	MAY-SEP	673.0	325.0	48	530.0	79	215.0	32
WILLOW CREEK near Harrison	MAY-JUL	16.2	9.6	59	16.0	99	3.0	19
	MAY-SEP	18.6	11.0	59	18.0	97	4.0	22

RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
LIMA	84.0	58.8	67.2	56.5	BEAVERHEAD	29	29	28
CLARK CANYON	255.6	168.5	164.8	163.2	RUBY	13	42	36
RUBY RIVER	38.8	40.4	40.1	35.6	BIGHOLE	28	35	31
					BOULDER	14	36	24
					JEFFERSON	66	33	29

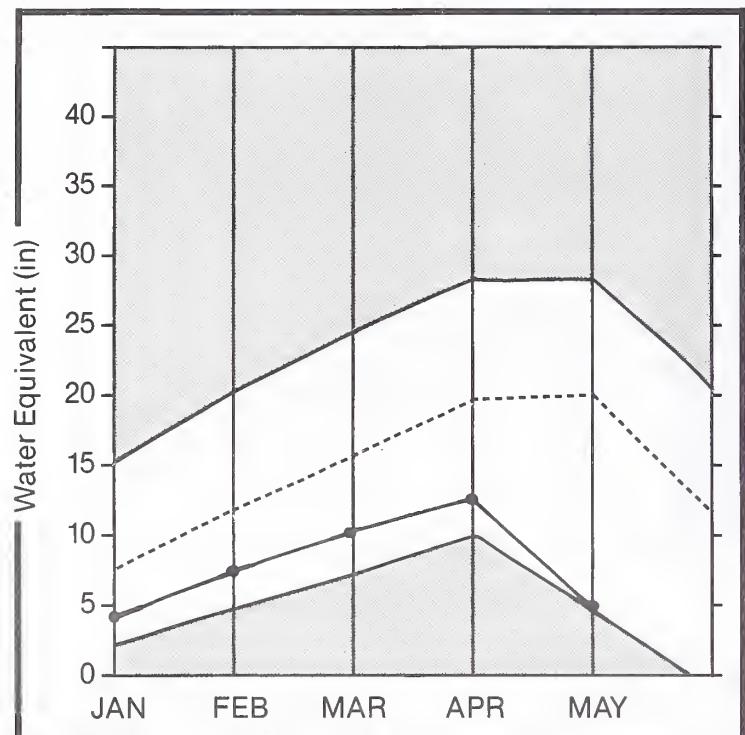
1 - Reas. max, and reas. min, forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Madison Basin

Mountain snowpack* (inches)



*Madison

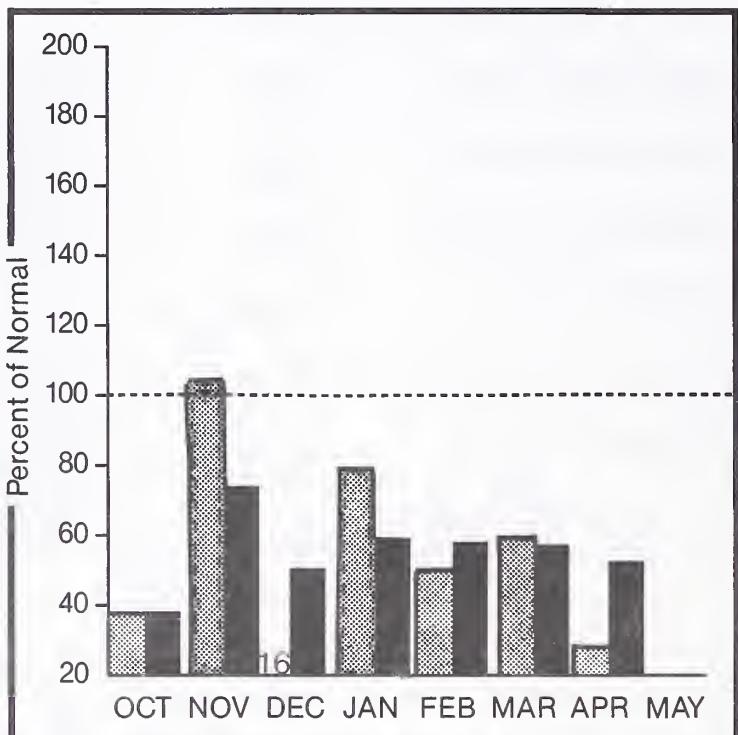
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year-to-date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation for April was only about 30 percent of average. This is the fifth consecutive month of below average precipitation. Temperatures were well above average during April and reduced the season's low snowpack levels even further. Currently, the water stored in the snowpack is only about 15 percent of average above Hebgen and about 30 percent in the Madison, Gravelly and Tobacco Root ranges. New record low water contents for May 1 were recorded at some snow courses. Runoff in April was above average in the upper basin and a little below average downstream from Hebgen. Streamflow for the next five months is forecast to be in the 60 to 70 percent of average range. Peak snowmelt runoff occurred around May 1 and was well below average.

For more information contact your local Soil Conservation Service office.

MADISON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MADISON RIVER near Grayling 2	MAY-JUL	333.0	230.0	69	290.0	87	190.0	57
	MAY-SEP	443.0	315.0	71	380.0	86	250.0	56

RESERVOIR	RESERVOIR STORAGE (1000AF)			WATERSHED SNOWPACK ANALYSIS				
	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			LAST YR.	AVERAGE
ENNIS LAKE	41.0	27.4	33.0	35.7	MADISON above HEEGEN	11	11	12
HEEGEN LAKE	377.5	316.3	289.3	236.2	LOWER MADISON	21	34	29
					MADISON	32	25	23

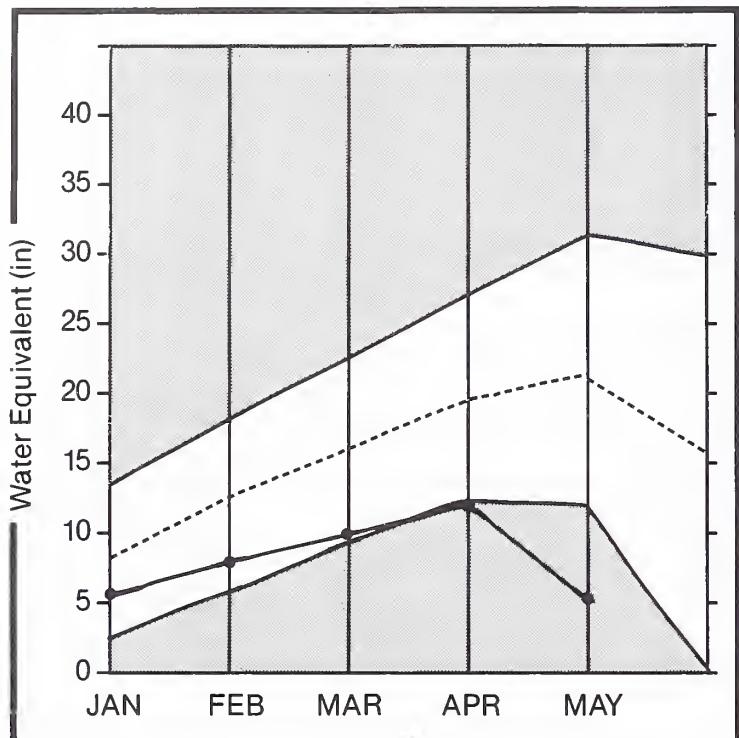
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Gallatin Basin

Mountain snowpack* (inches)



*Gallatin

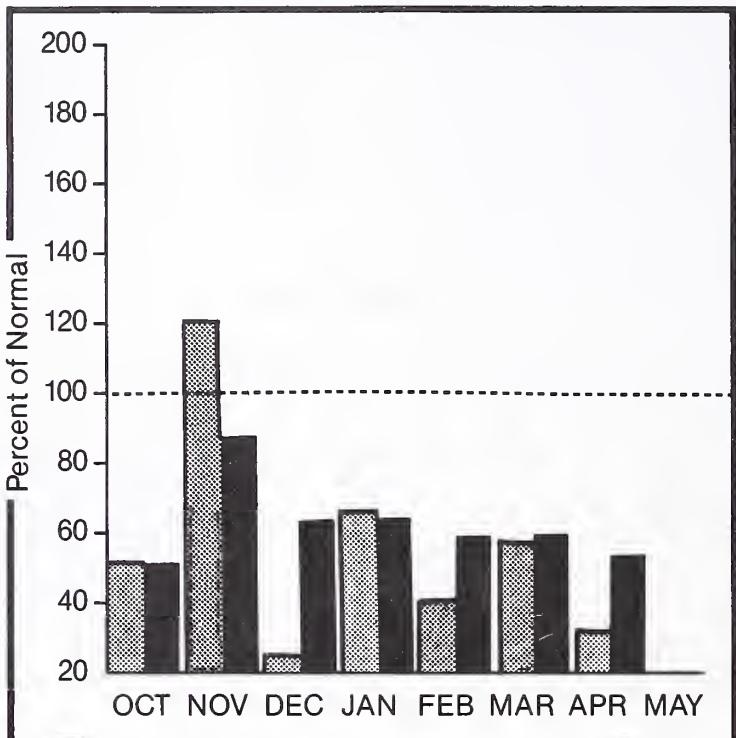
Maximum 

Average 

Minimum 

Current 

Precipitation* (percent of normal)



*Based on selected stations



Monthly precipitation



Year to date precipitation

WATER SUPPLY OUTLOOK:

April temperatures were well above average. April precipitation was about 30 percent of average which makes five consecutive months of below average moisture. Snowpacks in the Gallatin vary from about 22 to 33 percent of average. Some snow courses reported new record low water contents for May 1. April runoff was above average in the upper drainages but below average at Logan due to irrigation withdrawals. Streamflow for the next five months is forecast to be well below average. It is expected the Gallatin River and Hyalite Creek will reach their snowmelt peak before mid-May. The East Gallatin has already peaked. Shortages of irrigation water are expected to become widespread by early June.

For more information contact your local Soil Conservation Service office.

GALLATIN RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
GALLATIN RIVER near Gateway	MAY-JUL	430.0	235.0	55	300.0	70	170.0	40
	MAY-SEP	510.0	290.0	57	380.0	75	200.0	39
E & W FK. HYALITE CRK nr Bozeman 2	MAY-JUL	23.0	15.0	65	18.0	78	12.0	52
	MAY-SEP	27.0	18.3	68	23.0	85	14.0	52
HYALITE CREEK near Bozeman 2	MAY-JUL	35.0	21.0	60	30.0	86	14.0	40
	MAY-SEP	41.0	25.0	61	34.0	83	17.0	41
GALLATIN RIVER at Logan	MAY-JUL	458.0	140.0	31	270.0	59	48.0	10
	MAY-SEP	546.0	175.0	32	320.0	59	58.0	11

RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **	WATERSHED	NO. COURSES AVG'D	THIS YEAR AS % OF LAST YR. AVERAGE
	THIS YEAR	LAST YEAR	Avg.		
MIDDLE CREEK	8.0	7.0	6.8	15	39 33
			4.4		
				12	36 22
					24 35 25

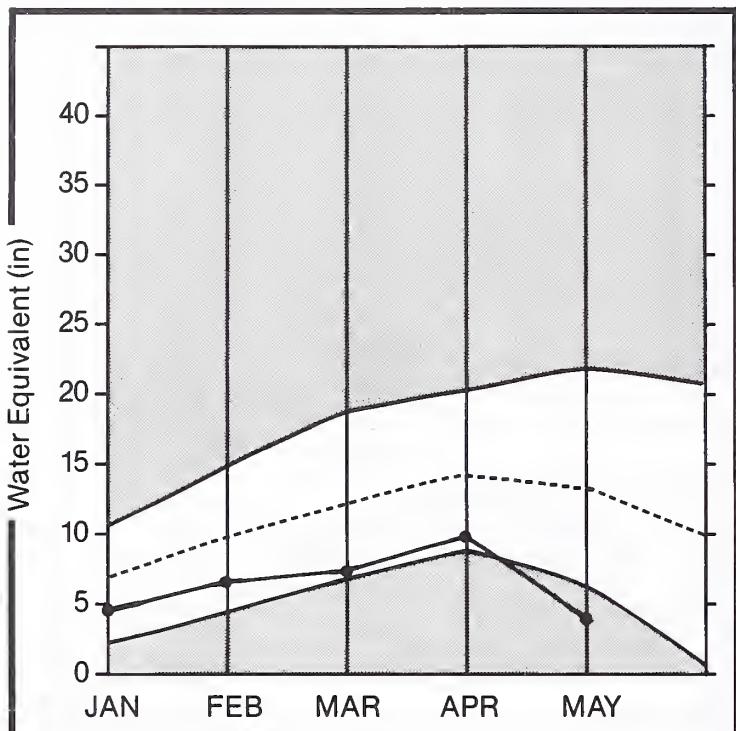
1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Missouri Basin

Mountain snowpack* (inches)



*Missouri Toston to Fort Peck

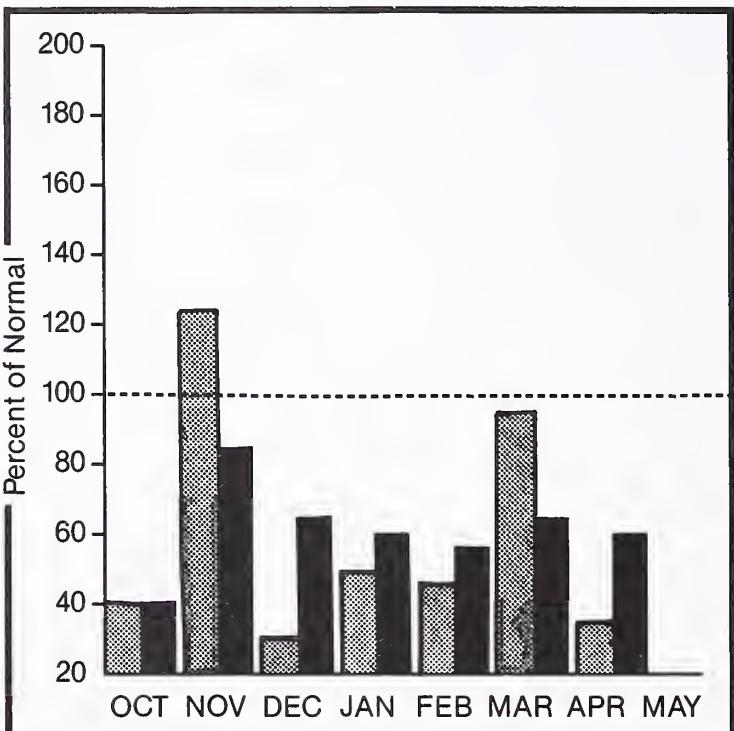
Maximum 

Average 

Minimum 

Current 

Precipitation* (percent of normal)



*Based on selected stations



Monthly precipitation 

WATER SUPPLY OUTLOOK:

April precipitation was only about one-third of average in the mountains. Above normal temperatures in April created considerable melt of the already below average snowpack. The amount of water stored in the snow is only about 20 to 25 percent of average. Some snow courses reported new record low water contents for May 1. Runoff in April was generally below average on the smaller streams and above average in the Missouri drainage. Streamflows for the next five months are forecast to be well below average. Most streams reached their peak snowmelt runoff by early May at well below average flows. On streams not having reservoir storage, shortages of irrigation water are expected to be quite common by late May.

For more information contact your local Soil Conservation Service office.

MISSOURI RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
MISSOURI RIVER at Toston 2	MAY-JUL	1890.0	810.0	43	1510.0	80	660.0	35
	MAY-SEP	2230.0	1010.0	45	1790.0	80	780.0	35
SHEEP CREEK nr White Sulphur Spgs.	MAY-JUL	17.1	7.0	41	13.0	76	6.0	35
	MAY-SEP	20.0	8.6	43	15.0	75	7.0	35
BELT CREEK near Monarch	MAY-JUL	114.0	52.0	46	90.0	79	30.0	26
	MAY-SEP	126.0	63.0	50	103.0	82	34.0	27
MISSOURI RIVER at Fort Benton 2	MAY-JUL	2930.0	1350.0	46	2280.0	78	1020.0	35
	MAY-SEP	3450.0	1670.0	48	2690.0	78	1210.0	35
MISSOURI RIVER at Virgelle 2	MAY-JUL	3350.0	1740.0	52	2850.0	85	1210.0	36
	MAY-SEP	3900.0	2120.0	54	3320.0	85	1400.0	36
MISSOURI RIVER near Landusky 2	MAY-JUL	3650.0	1940.0	53	3180.0	87	1320.0	36
	MAY-SEP	4240.0	2340.0	55	3690.0	87	1530.0	36
N.F. MUSSELSHELL near Delpine	MAY-JUL	4.0	1.0	25	3.0	75	0.0	0
	MAY-SEP	4.9	1.5	31	4.0	82	0.0	0
S.F. MUSSELSHELL above Martinsdale	MAY-JUL	51.0	18.0	35	38.0	75	5.0	10
	MAY-SEP	55.0	19.1	35	42.0	76	5.0	9
MISSOURI RIVER below Fort Peck 2	MAY-JUL	3560.0	1790.0	50	3130.0	88	1140.0	32
	MAY-SEP	4100.0	2150.0	52	3610.0	88	1310.0	32
LAKE SAKAKAWEA Inflow 2	MAY-JUL	9210.0	5620.0	61	8470.0	92	3680.0	40
	MAY-SEP	10380.0	6530.0	63	9570.0	92	4160.0	40

RESERVOIR	RESERVOIR STORAGE (1000AF)			WATERSHED SNOWPACK ANALYSIS			
	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES	THIS YEAR AS % OF LAST YR, AVERAGE
		THIS YEAR	LAST YEAR	AVG.			
CANYON FERRY LAKE	2043.0	1573.0	1540.0	1505.0	MISSOURI HEADWATERS	105	30 26
HELENA VALLEY	9.2	7.8	8.4	7.5	WEST SIDE MISSOURI	11	44 27
LAKE HELENA	10.4	10.9	10.9	10.9	SMITH-BELT	11	28 28
HAUSER & HELENA	61.9	63.1	63.0	60.0	MISSOURI MAINSTEM	22	34 24
HOLTER LAKE	81.9	80.5	80.5	72.6	SUN-TETON-MARIAS	17	68 43
SMITH RIVER	10.6	9.8	10.5	9.4	JUDITH-MUSSELSHELL	17	28 19
NEWLAN CREEK	12.4	10.5	11.2	9.7	MISSOURI above FORT PECK	146	34 27
BAIR	7.0	7.0	4.3	6.0	MILK HEADWATERS	4	79 29
MARTINSDALE	23.1	15.1	19.7	12.3	BEAR PAW	7	0 11
DEADMAN'S BASIN	72.2	63.3	44.4	56.6	MILK RIVER	11	85 26
FORT PECK LAKE*	18.9	16.1	14.4	15.3	MISSOURI in MONTANA	155	34 27
					MISSOURI b/w YELLOWSTONE	259	37 33

*Million Acre Feet

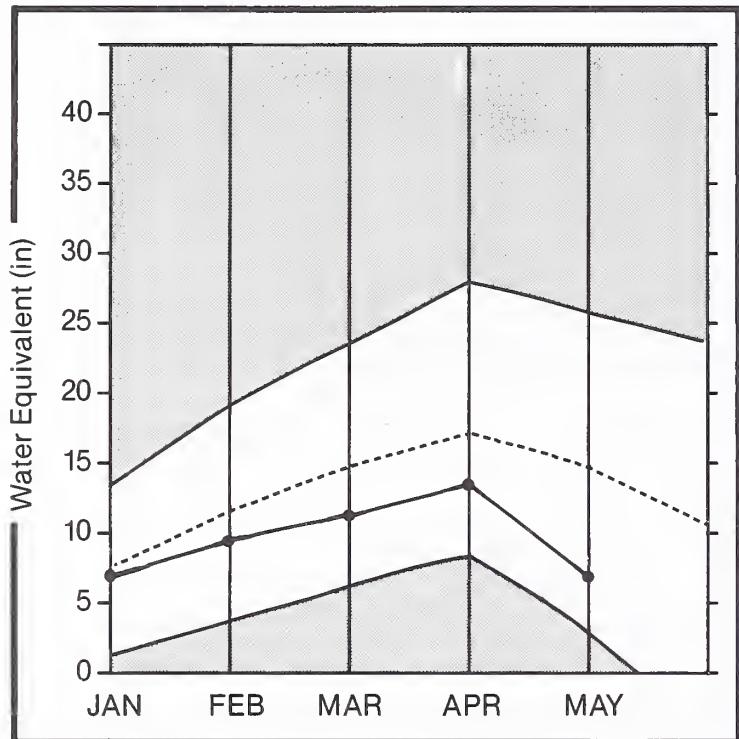
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2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Sun, Teton and Marias Basins

Mountain snowpack* (inches)



*Sun-Teton-Marias

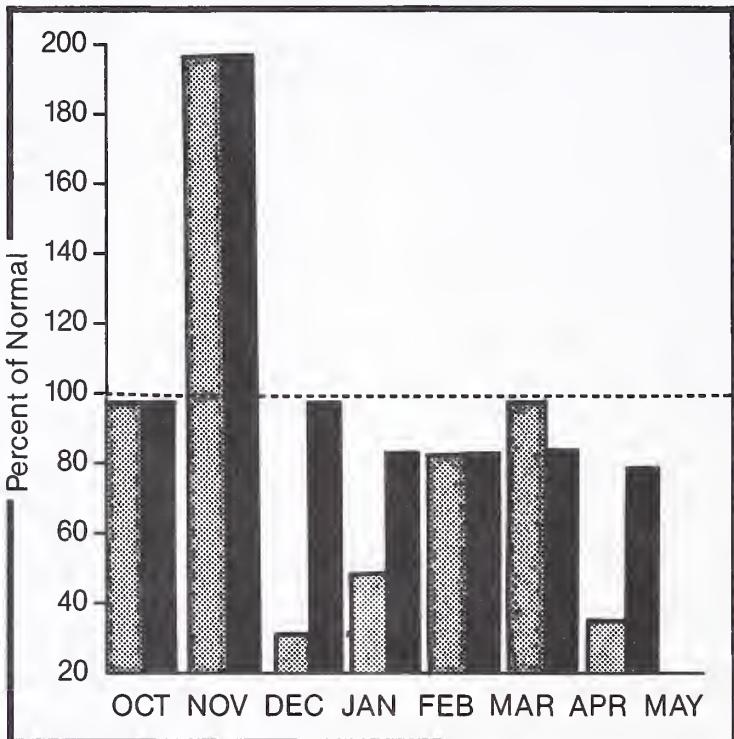
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Mountain precipitation in April was only about 30 percent of average. Above average temperatures have reduced the snowpack levels to about 30 percent of average in the Sun and Teton drainages and about 60 percent of average in the Birch, Two Medicine, Badger and Cut Bank Creek headwaters. April runoff was above average. Streamflow for the next five months is forecast to be around 65 to 85 percent of average. Most streams reached their peak snowmelt runoff by early May at well below average flows. Water stored in irrigation reservoirs will help provide much needed supplies of water in the summer.

For more information contact your local Soil Conservation Service office.

SUN-TETON-MARIAS RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SUN RIVER at Gibson Dam 2	MAY-JUL	462.0	310.0	67	425.0	92	195.0	42
	MAY-SEP	511.0	350.0	68	475.0	93	225.0	44
TWO MEDICINE CREEK near Browning 2	MAY-JUL	197.0	155.0	79	230.0	117	80.0	41
	MAY-SEP	210.0	165.0	79	240.0	114	90.0	43
BADGER CREEK near Browning	MAY-JUL	97.0	80.0	82	117.0	121	43.0	44
	MAY-SEP	114.0	95.0	83	135.0	118	55.0	48
SWIFT RESERVOIR Inflow nr Dupuyer	MAY-JUL	64.0	53.0	83	77.0	120	29.0	45
	MAY-SEP	76.0	62.0	82	89.0	117	35.0	46
CUT BANK CREEK at Cut Bank	MAY-JUL	79.0	67.0	85	97.0	123	37.0	47
	MAY-SEP	88.0	75.0	85	107.0	122	43.0	49
MARIAS RIVER near Shelby	MAY-JUL	412.0	290.0	70	445.0	108	133.0	32
	MAY-SEP	436.0	310.0	71	465.0	107	153.0	35

RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.				
GIBSON	99.1	84.9	78.6	53.9	SUN-TETON	12	51	28
PISHKUN	32.0	27.6	21.9	26.6	MARIAS	6	80	57
WILLOW CREEK	32.2	29.3	31.2	23.7	SUN-TETON-MARIAS	17	68	43
LOWER TWO MEDICINE LAKE	11.9	12.2	---	10.6				
FOUR HORNS LAKE	19.2	12.8	---	12.8				
SWIFT	30.0	24.9	14.0	16.1				
LAKE FRANCES	112.0	94.1	103.8	74.6				
LAKE ELWELL (TIBER)	1347.0	748.4	813.1	582.5				

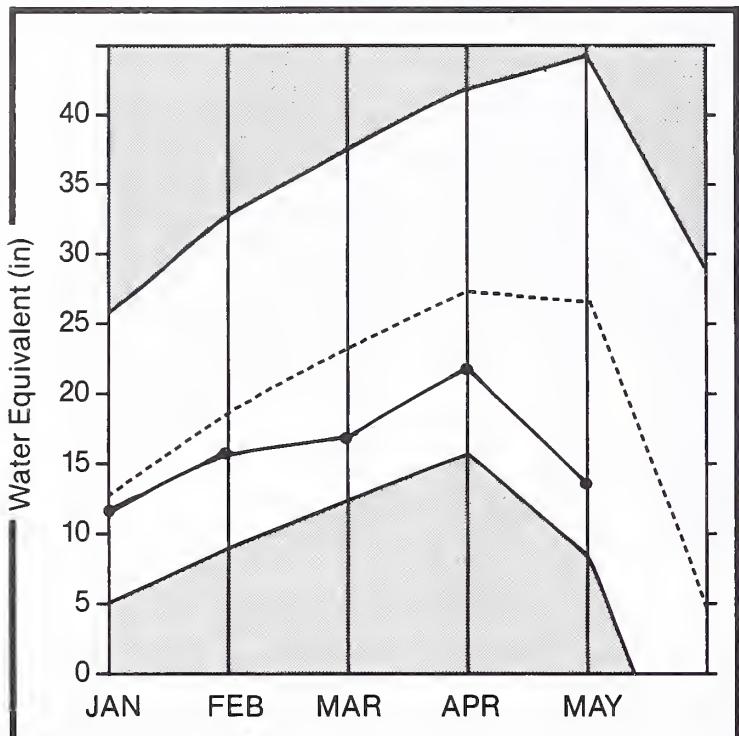
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The average is computed for the 1961-85 base period.

St. Mary and Milk Basins

Mountain snowpack* (inches)



* St. Mary

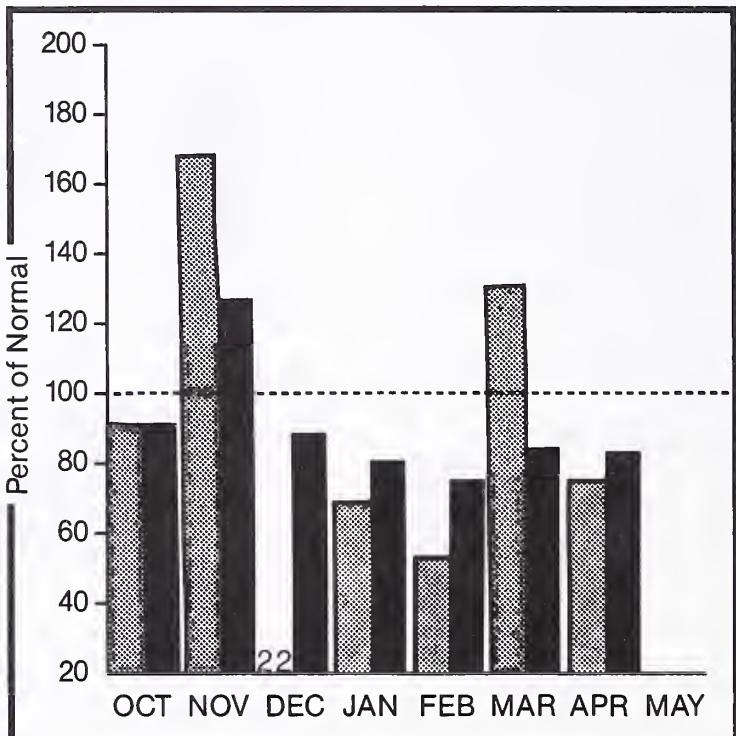
Maximum

Average

Minimum

Current

Precipitation* (percent of normal)



*Based on selected stations



Monthly precipitation



WATER SUPPLY OUTLOOK:

April precipitation in the mountains was about 75 percent of average. Above normal temperatures reduced the snowpack levels to about one-half of average in the St. Mary and one-quarter of average in the Milk drainages. April runoff was well above average on the St. Mary River and below average in the Milk River drainage. Forecasts of streamflow for the next five months are around 75 percent of average on the St. Mary. Runoff on the Milk River without St. Mary Canal is expected to be well below average.

For more information contact your local Soil Conservation Service office.

ST. MARY and MILK RIVER BASINS

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
SWIFTCURRENT CREEK at Sherburne 2	MAY-JUL	101.0	77.0	76	99.0	98	55.0	54
	MAY-SEP	119.0	90.0	76	119.0	100	61.0	51
ST. MARY'S RIVER near Babb 2	MAY-JUL	383.0	290.0	76	360.0	94	220.0	57
	MAY-SEP	453.0	350.0	77	430.0	95	270.0	60
MILK RIVER at Eastern Crossing	MAY-SEP	51.0	28.0	55				
MILK RIVER at Eastern Crossing 2	MAY-SEP	204.0	215.0	105				

RESERVOIR STORAGE (1000AF) | WATERSHED SNOWPACK ANALYSIS

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.			Avg'D	LAST YR.
LAKE SHERBURNE	64.3	29.1	4.9	19.6	MILK HEADWATERS	4	79	29
FRESNO	127.0	105.3	104.6	96.5	BEAR PAW	7	0	11
BEAVER CREEK	3.5	3.3	3.3	2.6	MILK RIVER	11	85	26
NELSON	66.8	54.7	59.9	42.0	ST. MARY	11	106	52
					ST. MARY and MILK	18	107	51
					BOW RIVER in ALBERTA	14	78	96
					OLOMAN RIVER in ALBERTA	3	121	85

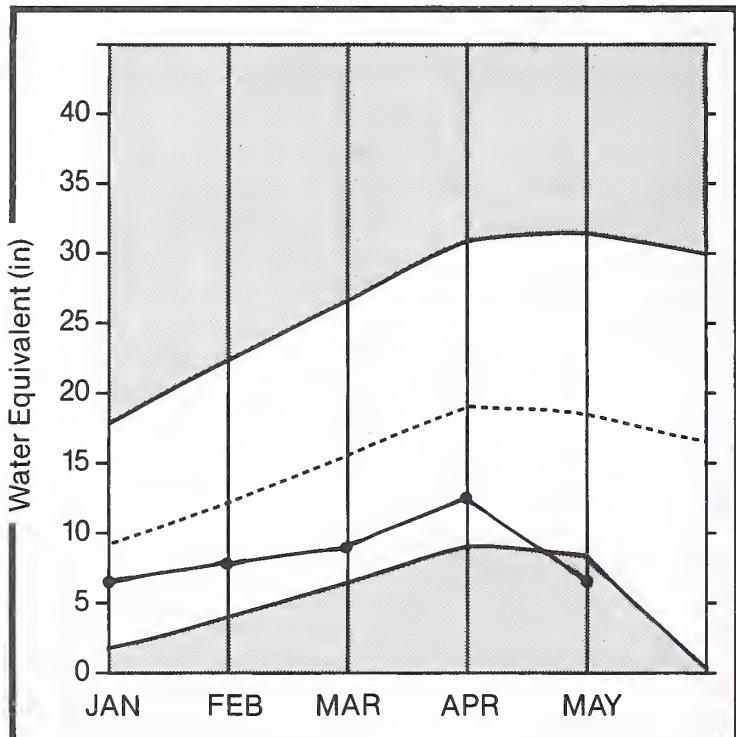
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2 - Corrected for upstream diversions or changes in reservoir storage.

The average is computed for the 1961-85 base period.

Yellowstone Basin

Mountain snowpack* (inches)



*Yellowstone above Big Horn

Maximum



Average



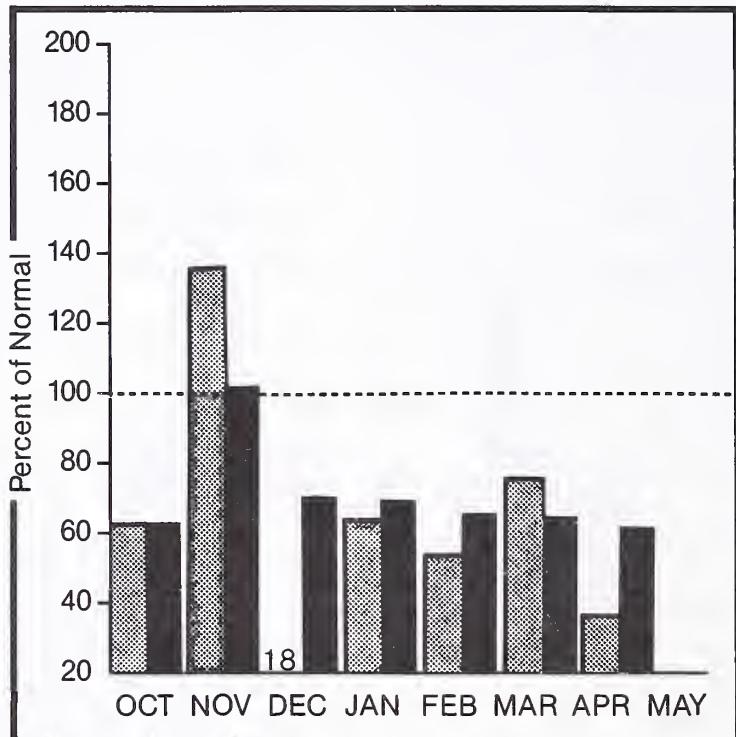
Minimum



Current



Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation



Year to date precipitation



WATER SUPPLY OUTLOOK:

April precipitation in the mountains was only about 35 percent of average stretching the string of months with below average moisture to five. Above average temperatures in April have reduced the snowpack levels to less than one-half of average. Many snow courses reported new record low water contents for May 1. Runoff in April was above average. Streamflow for the next five months is forecast to be in the range of 55 to 70 percent of average. The peak snowmelt runoff is expected to occur by mid-May at much below average flows. Irrigation water is expected to become short by late May or early June on Yellowstone River tributaries.

For more information contact your local Soil Conservation Service office.

YELLOWSTONE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	25 YR. AVG. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVG.)	REAS. MAX. (1000AF)	REAS. MAX. (% AVG.)	REAS. MIN. (1000AF)	REAS. MIN. (% AVG.)
YELLOWSTONE at Lake Outlet	MAY-SEP	784.0	495.0	63	590.0	75	400.0	51
YELLOWSTONE at Corwin Springs	MAY-JUL	1570.0	900.0	57	1150.0	73	815.0	52
	MAY-SEP	1910.0	1090.0	57	1400.0	73	990.0	52
YELLOWSTONE near Livingston	MAY-JUL	1810.0	1000.0	55	1290.0	71	975.0	54
	MAY-SEP	2220.0	1250.0	56	1610.0	73	1230.0	55
BOULDER RIVER at Big Timber	MAY-JUL	340.0	210.0	62	280.0	82	190.0	56
	MAY-SEP	372.0	230.0	62	310.0	83	205.0	55
STILLWATER RIVER nr Absarokee 2	MAY-JUL	501.0	315.0	63	445.0	89	260.0	52
	MAY-SEP	602.0	385.0	64	515.0	86	310.0	51
CLARKS FORK RIVER near Belfry	MAY-JUL	519.0	360.0	69	460.0	89	260.0	50
	MAY-SEP	582.0	410.0	70	520.0	89	300.0	52
COONEY RESERVOIR Inflow	MAY-JUL	41.0	28.0	68	39.0	95	20.0	49
	MAY-SEP	51.0	35.0	69	47.0	92	25.0	49
YELLOWSTONE RIVER at Billings 2	MAY-JUL	3480.0	1980.0	57	2890.0	83	1640.0	47
	MAY-SEP	4160.0	2660.0	64	3450.0	83	1950.0	47
BIGHORN RIVER at St. Xavier 2	MAY-JUL	1580.0	1110.0	70	1750.0	111	740.0	47
	MAY-SEP	1790.0	1290.0	72	1990.0	111	840.0	47
LITTLE BIGHORN RIVER near Hardin	MAY-JUL	125.0	84.0	67	142.0	114	38.0	30
	MAY-SEP	144.0	100.0	69	165.0	115	45.0	31
TONGUE RIVER at Decker	MAY-JUL	210.0	147.0	70	275.0	131	67.0	32
	MAY-SEP	235.0	170.0	72	310.0	132	75.0	32
YELLOWSTONE RIVER at Miles City 2	MAY-JUL	5150.0	3350.0	65	4890.0	95	2320.0	45
	MAY-SEP	6020.0	4010.0	67	5720.0	95	2710.0	45
POWDER RIVER at Moorehead	MAY-JUL	204.0	136.0	67	300.0	147	55.0	27
	MAY-SEP	218.0	150.0	69	320.0	147	59.0	27
YELLOWSTONE RIVER near Sidney 2	MAY-JUL	5700.0	3540.0	62	5470.0	96	2340.0	41
	MAY-SEP	6640.0	4250.0	64	6370.0	96	2720.0	41

RESERVOIR	RESERVOIR STORAGE (1000AF)				WATERSHED SNOWPACK ANALYSIS			
	USEABLE CAPACITY	** USEABLE STORAGE **			WATERSHED	NO. COURSES	THIS YEAR AS % OF	
		THIS YEAR	LAST YEAR	AVG.				
MYSTIC LAKE	21.0	2.6	1.1	2.0	YELLOWSTONE ab LIVINGSTON	22	37	38
COONEY	27.4	24.4	24.5	18.6	SHIELDS	10	21	11
BIGHORN LAKE	1356.0	793.2	709.1	681.2	BOULDER-STILLWATER	9	58	48
TONGUE RIVER	68.0	45.6	28.3	36.7	CLARK'S FORK-ROCK CREEK	22	42	43
					YELLOWSTONE above BIGHORN	49	41	35
					LITTLE BIGHORN	5	46	48
					WIND RIVER (Wyoming)	31	35	53
					BIGHORN RIVER (Wyoming)	34	41	47
					BIGHORN BASIN (Total)	60	39	48
					TONGUE RIVER (Wyoming)	15	38	43
					POWDER RIVER (Wyoming)	15	31	34
					YELLOWSTONE RIVER	119	39	40

1 - Reas. max. and reas. min. forecasts are for 5% and 95% exceedance levels and also (2) below.

2 - Corrected for upstream diversions or changes in reservoir storage.

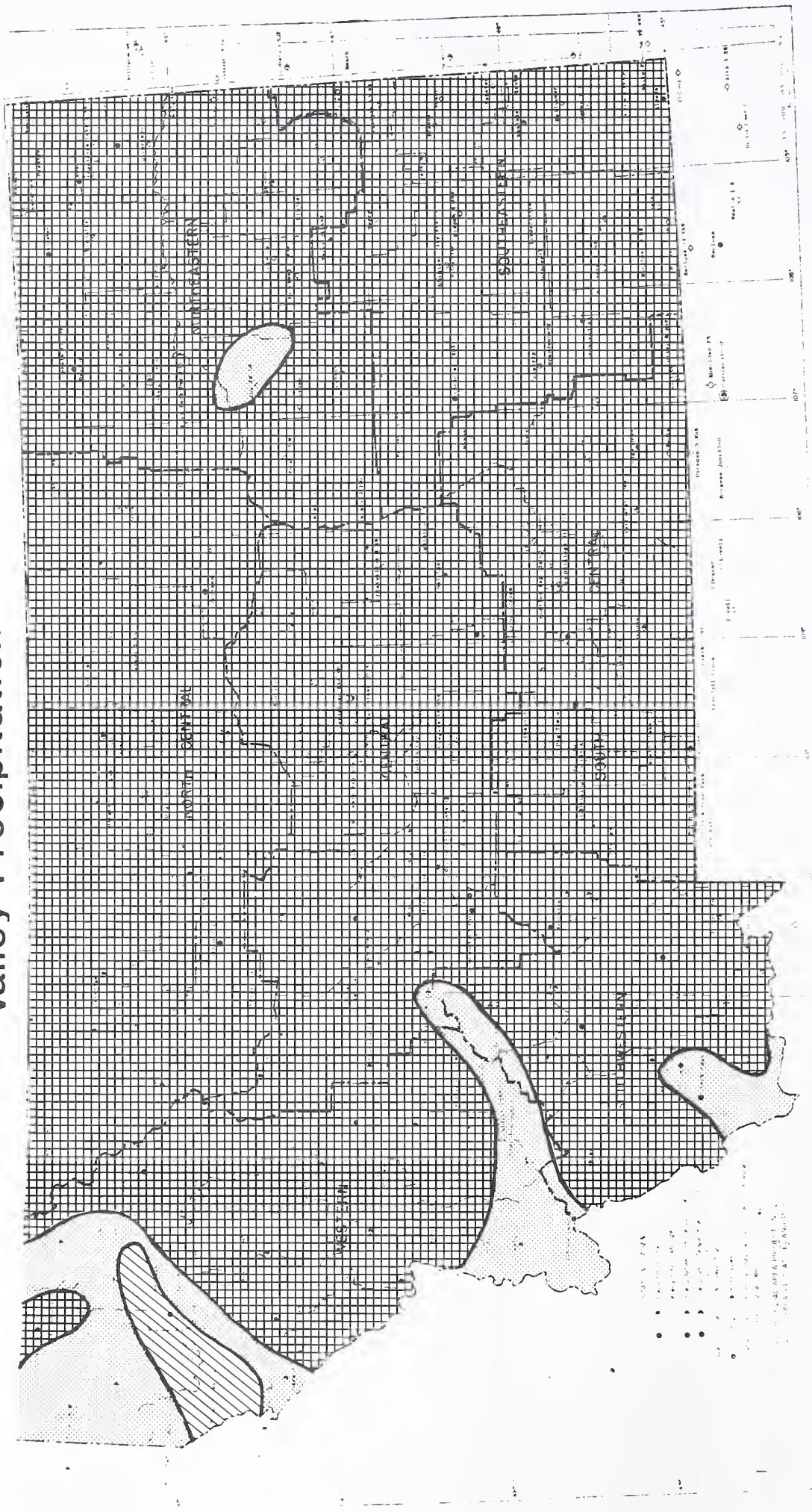
The average is computed for the 1961-85 base period.

Snow Data Measurements

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
MONTANA							COPPER CREEK	5700	4/26/87	0	.0	.0	10.1
ABUNDANCE LAKE	8800	4/25/87	36	11.4	22.0	23.8	COPPER MOUNTAIN	7700	4/27/87	3	.7	8.5	11.8
AMBROSE	6480	4/28/87	1	.1	9.3	13.7	COTTONWOOD CREEK	6400	4/27/87	0	.0	7.0	8.4
ARCH FALLS	7350	4/29/87	8	2.6	9.6	15.0	COYOTE HILL	4200	4/30/87	0	.0	--	3.3
ASHLEY DIVIDE	4820	4/26/87	0	.0	--	1.4	CRYSTAL LAKE	6050	4/29/87	0	.0	3.0	12.9
BADGER PASS PILLOW	6900	5/01/87	---	23.4	33.5	39.0	CRYSTAL LAKE PILLOW	6050	5/01/87	---	.0	2.3	12.5
BADGER PASS	6900	4/26/87	68	29.9	36.8	42.5	DAD CREEK LAKE	8400	4/26/87	36	11.8	18.0	17.2
BALD EAGLE PEAK	5700	5/04/87	104	43.7	44.5	63.0	DAISY PEAK	7600	4/30/87	0	.0	7.8	10.2
BALD RIDGE	7500	4/28/87	0	.0	6.8	13.3	DALY CREEK	5780	4/29/87	8	2.8	11.0	12.4
BANFIELD MTN PILLOW	5600	5/04/87	---	9.0	13.7	18.6	DALY CREEK PILLOW	5780	5/01/87	---	.0	2.7	6.0
BANFIELD MOUNTAIN	5600	5/04/87	18	9.0	12.3	22.4	DARKHORSE LK. PILLOW	8700	5/01/87	---	13.5	30.6	27.9
BAREE CREEK	5500	4/30/87	52	26.1	25.3	45.6	DARKHORSE LAKE	8600	4/25/87	37	12.6	30.8	30.1
BAREE MIDWAY	4600	4/30/87	27	12.4	13.5	31.8	DAVIS CREEK	5400	5/04/87	0	.0	13.4	22.3
BAREE TRAIL	3800	4/30/87	0	.0	.0	1.5	DEADMAN CR PILLOW	6450	5/01/87	---	.0	.2	6.9
BARKER LAKES PILLOW	8250	5/01/87	---	8.5	17.1	17.0	DEADMAN CREEK	6450	5/01/87	0	.0	1.0	8.7
BASIN CREEK	7180	4/29/87	0	.0	9.7	10.3	DESERT MOUNTAIN	5600	5/04/87	0	.0	5.2	14.3
BASIN CREEK PILLOW	7180	5/01/87	---	5.9	8.4	9.9	DEVILS SLIDE	8100	4/29/87	34	12.8	20.7	27.1
BASSOO PEAK	5150	4/28/87	0	.0	.0	6.8	DISCOVERY BASIN	7050	4/29/87	0	.0	8.8	11.0
BEAGLE SPRINGS	8850	4/26/87	14	4.2	10.6	9.6	DIVIDE	7800	4/26/87	6	1.6	8.1	11.4
BEAGLE SPGS PILLOW	8850	5/01/87	---	1.2	10.9	9.0	DIVIDE PILLOW	7800	5/01/87	---	4.5	12.6	12.8
BEAR BASIN	8150	4/28/87	17	6.8	15.4	23.4	DIX HILL	6400	4/26/87	0	.0	1.0	5.4
BEAR PAW SKI AREA	5200	4/25/87	0	.0	.0	4.2	DUPUYER CREEK PILLOW	5750	5/01/87	---	.1	1.0	10.7
BEAVER CREEK PILLOW	7850	5/01/87	---	6.4	22.1	21.8	EAST BOULDER S	9250	4/28/87	34	13.5	31.0	34.5
BIG CREEK	6750	4/29/87	69	34.2	51.4	51.2	EAST FORK R.S.	5400	4/28/87	0	.0	.0	1.2
BIG SKY	7700	4/28/87	7	2.6	12.6	17.7	ELK HORN SPRINGS	7800	4/25/87	0	.0	7.0	8.6
BIG SKY MEADOW	6350	4/28/87	0	.0	.3	3.9	ELK PEAK	8000	4/30/87	13	5.4	17.2	20.0
BIG SNOWY	7150	4/29/87	31	11.4	21.2	25.3	EMERY CREEK	4350	5/04/87	0	.0	1.6	9.7
BLACK BEAR	7950	4/29/87	26	9.8	51.0	44.2	EMERY CREEK PILLOW	4350	5/01/87	---	.2	4.0	8.5
BLACK BEAR PILLOW	7950	5/01/87	---	9.9	47.3	39.1	FATTY CREEK	5500	4/30/87	26	12.6	13.0	24.8
BLACK MOUNTAIN	7750	4/27/87	22	7.6	15.6	18.1	FISH CREEK	8000	4/29/87	0	.0	12.6	13.4
BLACK PINE PILLOW	7100	5/01/87	---	.1	10.0	14.8	FISHER CREEK PILLOW	9100	5/01/87	---	20.3	40.1	39.5
BLACK PINE	7100	4/29/87	0	.0	7.0	13.9	FISHER CREEK	9100	4/30/87	48	19.7	43.6	42.8
BLACKTAIL	5650	4/28/87	3	.9	--	--	FIVE-BULL	5700	4/26/87	0	.0	--	3.8
BLOODY DICK PILLOW	7550	5/01/87	---	.1	10.9	10.0	FLATTOP MTN PILLOW	6300	5/01/87	---	35.9	38.5	49.2
BLOODY DICK	7600	4/25/87	11	3.0	11.0	13.7	FLEECER RIDGE	7500	4/29/87	0	.0	4.6	9.5
BLUE LAKE	5900	4/26/87	32	14.8	16.0	24.4	FOOLHEN	8280	4/25/87	28	8.8	17.5	19.3
BOTS SOTS	7750	4/27/87	2	.8	4.7	9.3	FOUR MILE	6900	5/01/87	0	.0	3.0	8.1
BOULDER MOUNTAIN	7950	4/27/87	28	11.0	21.7	22.7	FOURTH OF JULY	3450	4/30/87	0	.0	.0	1.2
BOULDER MTN PILLOW	7950	5/01/87	---	5.6	21.0	22.6	FRED BURR PASS	8000	5/01/87	32	12.6	29.0	29.4
BOX CANYON	6670	4/27/87	0	.0	.0	7.5	FREIGHT CREEK	6000	4/26/87	18	6.8	10.0	14.2
BOX CANYON PILLOW	6700	5/01/87	---	.0	.6	5.1	FRIDAY HILL	4620	4/30/87	0	.0	.0	12.0
BOXELDER CREEK	5100	4/25/87	5	1.4	.0	2.2	FROHNER MEADOWS	6480	4/29/87	0	.0	.4	6.1
BRANHAM LAKES	8850	4/28/87	45	18.2	30.4	35.1	FROHNER MDWS PILLOW	6480	5/01/87	---	.2	6.1	9.0
BRIDGER BOWL PILLOW	7250	4/30/87	---	3.5	16.7	29.7	GARVER CREEK PILLOW	4250	5/04/87	---	.0	.5	4.0
BRIDGER BOWL	7250	4/30/87	8	2.9	17.8	31.3	GARVER CREEK	4250	5/04/87	0	.0	.0	4.7
BRISTOW CREEK	3900	5/04/87	0	.0	.0	1.6	GIBBONS PASS	7100	4/28/87	15	5.8	18.9	23.9
BRUSH CREEK TIMBER	5000	4/30/87	0	.0	.6	7.0	GOAT MOUNTAIN	7000	4/29/87	4	1.0	2.5	9.5
BULL MOUNTAIN	6600	4/29/87	0	.0	.0	3.7	GOLD STONE	8100	4/25/87	24	7.9	17.6	19.2
CABIN CREEK	5200	4/26/87	0	.0	.0	2.2	GRASSHOPPER	7000	4/30/87	0	.0	.6	5.3
CALL ROAD	8050	4/26/87	17	4.9	10.4	13.9	GRAVE CRK PILLOW	4300	5/01/87	---	.0	.2	8.5
CALVERT CREEK	6430	4/29/87	0	.0	9.1	9.6	GRAVE CREEK	4300	5/04/87	0	.0	.0	14.1
CALVERT CR PILLOW	6430	5/01/87	---	.0	.0	2.5	GRIFFIN CR DIVIDE	5150	4/28/87	2	.6	1.4	7.3
CAMP MISERY	6400	5/04/87	69	31.3	35.9	53.9	GUNSLIGHT LAKE	6300	4/30/87	50	24.5	37.5	42.2
CAMP SENIA	7890	4/27/87	9	2.4	5.4	9.2	HAND CREEK	5030	4/30/87	4	1.2	8.0	10.1
CARROT BASIN PILLOW	9000	5/01/87	---	14.5	34.0	32.1	HAND CREEK PILLOW	5030	5/01/87	---	1.7	8.5	9.1
CARROT BASIN	9000	4/27/87	40	16.1	33.0	41.7	HAWKINS LAKE PILLOW	6450	5/04/87	---	19.6	30.9	30.1
CASHE CREEK PILLOW	7800	5/01/87	---	2.4	8.8	10.5	HAWKINS LAKE	6450	5/04/87	45	21.4	28.5	32.8
CEDAR GROVE	3760	5/04/87	0	.0	.0	6.1	HEART LAKE TRAIL	4800	5/01/87	6	2.7	11.2	17.4
CHESSMAN RESERVOIR	6200	4/29/87	0	.0	.2	2.7	HEBGEN DAM	6550	5/01/87	0	.0	5.0	7.6
CHICKEN CREEK	4060	4/28/87	0	.0	.0	3.8	HELL ROARING DIVIDE	5770	5/01/87	44	18.4	21.4	31.6
CLOVER MDW PILLOW	8800	5/01/87	---	7.1	19.5	19.0	HERRIG JUNCTION	4850	4/28/87	33	14.4	11.8	25.0
CLOVER MEADOW	8600	4/26/87	22	6.8	17.8	20.6	HOLBROOK	4530	4/22/87	0	.0	.0	2.0
COLE CREEK	7850	4/27/87	44	16.0	21.0	23.3	HOOD MEADOW	6600	4/29/87	1	.4	3.1	11.4
COLE CREEK PILLOW	7850	5/01/87	---	13.2	20.8	20.6	HOODOO BASIN PILLOW	6050	5/01/87	---	29.0	40.1	49.6
COLLEY CREEK	6300	4/29/87	0	.0	1.2	4.2	HOODOO BASIN	6050	5/01/87	63	31.1	45.9	53.2
COMBINATION	5600	4/29/87	0	.0	.0	3.5	HOODOO CREEK	5900	5/01/87	54	27.2	36.8	49.3
COMBINATION PILLOW	5600	5/01/87	---	.0	.0	2.1	ICEBERG LAKE NO 3	5600	4/29/87	35	16.1	14.0	31.0
COOKE STATION	8150	4/30/87	21	5.9	22.2	21.4	INDEPENDENCE	7850	4/27/87	17	5.8	12.6	18.2
COPPER BOTTOM	5200	4/26/87	0	.0	.0	4.9	INTERGAARD	6450	4/28/87	1	.1	6.7	8.0
COPPER BOTTOM PILLOW	5200	5/01/87	---	.0	1.2	6.8	JAHNKE LAKE TRAIL	7200	4/25/87	0	.0	8.6	9.2
COPPER CAMP PILLOW	6950	5/01/87	---	8.6	25.4	33.5	JOHNSON PARK	6450	4/30/87	0	.0	.0	2.6
COPPER CAMP	6950	4/26/87	31	13.5	23.0	30.6	JOSEPHINE LONER NO 9	4900	4/28/87	10	4.2	3.0	16.5

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85	SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-85
KEELER CREEK	3300	5/04/87	0	.0	.0	1.2	PORCUPINE PILLOW	6500	5/01/87	---	.0	.4	4.4
KINGS HILL	7500	5/01/87	2	.9	15.3	16.1	PORCUPINE	6500	4/28/87	0	.0	2.0	7.4
KIWANIS CAMP	3720	4/25/87	0	.0	.0	.3	POTOMAEGTON PARK	7150	5/01/87	0	.0	7.6	10.7
KRAFT CREEK PILLOW	4750	5/01/87	---	.0	.0	4.0	PTARMIGAN	5800	4/29/87	52	25.5	22.4	37.9
LAKE CREEK	6100	4/26/87	0	.0	.1	3.6	REO MOUNTAIN	6000	4/28/87	22	8.5	10.0	18.6
LAKEVIEW CANYON	6930	4/24/87	14	4.2	9.0	12.3	RED TOP	5260	4/30/87	20	7.5	18.0	29.6
LAKEVIEW ROG. PILLOW	7400	5/01/87	---	.0	9.5	9.6	ROCK CREEK	5600	4/29/87	0	.0	.0	6.2
LAKEVIEW RIDGE	7400	4/24/87	11	2.9	6.5	10.3	ROCK CREEK MEADOW	8160	4/29/87	34	10.6	21.6	24.7
LEMHI PASS	7480	4/26/87	3	.8	7.5	7.2	ROCKER PEAK	8000	4/29/87	11	4.2	13.6	17.0
LEMHI RIDGE	8100	4/26/87	10	2.8	11.8	10.0	ROCKER PEAK PILLOW	8000	5/01/87	---	11.8	20.1	18.5
LEMHI RIDGE PILLOW	8100	5/01/87	---	.8	13.0	10.5	ROCKY BOY	4700	4/25/87	0	.0	.0	1.7
LICK CREEK PILLOW	6860	5/01/87	---	.0	4.1	8.6	ROCKY BOY PILLOW	4700	4/25/87	0	.0	.0	2.9
LICK CREEK	6860	4/29/87	6	2.4	7.3	10.3	SACAJAHEA	6550	4/30/87	0	.0	2.2	14.3
LITTLE PARK	7400	4/28/87	14	4.6	11.4	17.8	SADDLE MTN PILLOW	7900	5/01/87	---	8.8	25.3	29.1
LOGAN CREEK	4300	4/30/87	0	.0	.0	2.5	SADDLE MOUNTAIN	7940	4/28/87	32	12.5	24.9	28.6
LONE MOUNTAIN	8880	4/28/87	18	6.5	23.6	26.7	SENTINEL CREEK	8300	5/01/87	12	4.0	25.3	26.0
LOST HORSE	5940	4/30/87	31	14.6	25.5	33.9	SHORT CREEK	7000	4/23/87	1	.1	--	--
LOST SOUL	4800	5/04/87	0	.0	.0	8.8	SHOWER FALLS	8100	4/29/87	36	13.9	23.9	29.0
LOWER TWIN PILLOW	7900	5/01/87	---	11.6	21.1	22.7	SHOWER FALLS PILLOW	8100	5/01/87	---	12.6	25.8	29.5
LOWER TWIN	7900	5/01/87	19	8.2	21.3	25.2	SILVER RUN	6630	4/27/87	0	.0	.0	3.8
LUERECHT FLUME	4680	5/01/87	0	.0	.0	.6	SILVER RUN PILLOW	6630	5/01/87	---	.0	.1	1.4
LUERECHT PILLOW	4680	5/01/87	---	.0	.3	.4	SKALKAHO PILLOW	7260	5/01/87	---	12.6	25.0	25.6
LUERECHT FOREST NO 3	5450	5/01/87	0	.0	.0	3.6	SKALKAHO SUMMIT	7250	4/29/87	27	10.7	23.2	27.6
LUERECHT FOREST NO 4	4650	5/01/87	0	.0	.0	.2	SKYLARK TRAIL PILLOW	6200	5/01/87	---	10.8	24.2	34.0
LUERECHT FOREST NO 6	4040	5/01/87	0	.0	.0	.1	SLAG-A-MELT LAKE	8750	4/25/87	32	11.1	28.8	29.0
LUERECHT HYDROPILOT	4200	5/01/87	0	.0	.0	.3	SLIDE ROCK MOUNTAIN	7100	4/28/87	17	5.7	12.0	18.5
MADISON PLT PILLOW	7750	4/29/87	---	7.4	--	24.3	SMUGGLER MINE	6960	4/28/87	2	.6	6.1	9.9
MAISON PLATEAU	7750	4/29/87	7	2.5	26.5	23.2	S.F. SHIELDS PILLOW	8100	5/01/87	---	3.5	17.2	21.5
MANY GLACIER	4900	5/01/87	0	.0	2.6	12.2	S.F. SHIELS	8100	4/28/87	30	10.2	24.0	29.0
MANY GLACIER PILLOW	4900	5/01/87	---	.0	.0	8.6	SPOTTED BEAR MTN.	7000	4/30/87	0	.0	10.0	10.4
MARIAS PASS	5250	4/28/87	12	5.2	1.1	16.0	SPUR PARK PILLOW	8100	5/01/87	---	8.7	25.7	24.2
MAYNARD CREEK	6210	4/30/87	0	.0	6.2	17.0	SPUR PARK	8100	5/01/87	10	4.0	22.0	24.1
MAYNARD CR PILLOW	6210	4/30/87	---	.0	4.7	13.1	STAHL PEAK	6030	5/04/87	75	36.2	33.8	44.2
MIDDLE MILL CREEK	7850	4/28/87	7	2.6	9.9	18.2	STAHL PEAK PILLOW	6030	5/01/87	---	34.9	33.7	41.2
MILL CREEK	7500	4/29/87	0	.0	5.1	12.3	STAR LAKE E	9650	4/28/87	52	21.5	44.0	47.7
MINERAL CREEK	4000	4/30/87	0	.0	1.2	12.3	STEMPLE PASS	6600	4/28/87	9	3.0	6.8	11.1
MONUMENT PK PILLOW	8850	5/01/87	---	11.5	26.0	24.6	STORM LAKE	7780	5/04/87	4	1.5	15.3	16.1
MONUMENT PEAK	8850	4/27/87	46	15.7	29.2	30.0	STRYKER BASIN	6180	4/28/87	66	29.9	25.4	37.1
MOSS PEAK	6780	4/29/87	68	32.6	--	--	STUART MILL	6500	4/28/87	0	.0	.7	--
MOSS PEAK PILLOW	6780	5/01/87	---	29.0	40.0	48.1	STUART MOUNTAIN	7400	4/30/87	35	16.1	30.2	33.9
MOULTON RESERVOIR	6850	4/29/87	0	.0	1.4	3.1	SUCKER CREEK	3960	4/25/87	0	.0	.0	.4
MOUNT ALLEN NO 7	5700	4/28/87	68	31.4	25.6	46.1	TAYLOR ROAD	4080	4/25/87	0	.0	.0	.7
MT LOCKHART PILLOW	6400	5/01/87	---	12.0	20.0	23.0	TEN MILE LOWER	6600	4/28/87	0	.0	.2	6.2
MOUNT LOCKHART	6400	5/01/87	23	9.4	18.6	22.8	TEN MILE MIDDLE	6800	4/28/87	14	4.3	8.8	13.2
MUD LAKE	7650	4/30/87	14	4.8	18.6	20.4	TEN MILE UPPER	9000	4/28/87	15	4.5	11.4	16.1
MULE CREEK	8300	4/29/87	22	7.8	17.2	16.0	TEPEE CREEK PILLOW	8000	5/01/87	---	3.3	15.9	14.7
MULE CREEK PILLOW	8300	5/01/87	---	9.6	10.2	16.2	TEPEE CREEK	8000	4/26/87	25	7.8	16.3	17.6
NEVADA CREEK	6480	4/26/87	6	2.4	5.4	12.4	TIMBERLINE CREEK	8850	4/27/87	34	10.0	17.4	18.7
NEVADA CREEK PILLOW	6480	5/01/87	---	4.0	6.0	13.6	TIZER BASIN	6840	4/30/87	0	.0	--	--
NEWTON MOUNTAIN	5600	4/30/87	46	18.3	18.7	36.8	TRAIL CREEK	7090	4/26/87	0	.0	6.8	7.5
NEZ PERCE CMP PILLOW	5650	5/01/87	---	1.8	10.5	10.6	TRIMKUS LAKE	6100	4/30/87	42	20.6	34.6	45.2
NEZ PERCE CAMP	5650	4/28/87	2	1.0	8.9	12.7	TRUMAN CREEK	4060	4/27/87	0	.0	--	.7
NEZ PERCE CREEK	6600	4/27/87	0	.0	.2	4.3	TV MOUNTAIN	6800	4/30/87	10	3.8	16.8	20.0
NEZ PERCE PASS	6570	4/28/87	0	.0	7.8	15.5	TWELVEMILE PILLOW	5600	5/01/87	---	.0	2.4	13.2
NOISY BASIN	6040	5/04/87	65	30.0	33.2	52.5	TWELVEMILE CREEK	5600	4/30/87	0	.0	4.3	16.0
NOISY BASIN PILLOW	6040	5/01/87	---	26.3	38.6	46.7	TWENTY-ONE MILE	7150	4/29/87	0	.0	13.2	16.3
N.F. ELK CR PILLOW	6250	5/01/87	---	.0	6.2	10.2	TWIN CREEKS	3580	4/30/87	0	.0	--	2.3
N.F. ELK CREEK	6250	5/04/87	0	.0	7.2	10.1	TWIN LAKES PILLOW	6400	5/01/87	---	22.3	31.0	42.6
NORTH FORK JOCKO	6330	4/29/87	43	21.1	40.3	46.6	TWIN LAKES	6510	4/30/87	48	23.8	33.8	45.2
NORTH MEADOW	7500	5/01/87	0	.0	6.6	10.6	UPPER HOLLAND LAKE	6200	4/30/87	27	13.9	29.3	36.7
N.E. ENTRANCE PILLOW	7350	5/01/87	---	.0	1.5	6.7	WALDRON PILLOW	5600	5/01/87	---	.0	.3	7.0
NORTHEAST ENTRANCE	7350	5/02/87	0	.0	2.5	7.0	WALDRON	5600	5/01/87	0	.0	.0	5.5
NOTCH	8500	4/26/87	30	9.3	14.7	20.0	WARM SPRINGS	7800	5/01/87	19	6.8	22.7	22.0
OPHIR PARK	7150	4/26/87	23	7.8	12.7	18.2	WARM SPRINGS PILLOW	7800	5/01/87	---	12.6	26.8	31.2
PALISADE CREEK	8250	4/30/87	28	11.2	32.4	32.8	WEASEL DIVIOE	5450	5/04/87	42	20.2	20.0	35.1
PETERSON MDW PILLOW	7200	5/04/87	---	2.2	12.4	12.1	WEST YELL'ST PILLOW	6700	4/30/87	---	.0	3.5	6.2
PETERSON MEADOWS	7200	5/04/87	2	.6	11.0	11.6	WEST YELLOWSTONE	6700	4/30/87	0	.0	7.5	8.0
PICKET PIN D	9450	4/28/87	51	18.5	22.5	28.8	WHISKEY CREEK PILLOW	6800	5/01/87	---	2.9	19.7	15.7
PICKFOOT CREEK	6650	4/27/87	0	.0	2.0	7.1	WHISKEY CREEK	6800	4/29/87	0	.0	18.4	18.7
PICKFOOT CRK PILLOW	6650	5/01/87	---	.0	1.6	6.7	WHITE MILL PILLOW	8700	5/01/87	---	12.9	31.1	27.9
PIEGAN PASS NO 6	5500	4/28/87	51	24.0	18.9	39.6	WHITE MILL	8700	4/30/87	34	13.2	33.6	30.5
PIKE CREEK PILLOW	5930	5/01/87	---	13.1	19.6	26.8	WHITE PINE RIDGE	8850	4/26/87	10	2.6	5.6	6.4
PIESTONE PASS	7200	4/27/87	2	.9	1.6	5.7	WILLOW CREEK	6500	4/27/87	0	.0	1.4	5.4
PLACER BASIN F	8830	4/28/87	28	13.5	18.0	23.4	WOOD CREEK	5960	4/26/87	0	.0	5.2	7.5
PLACER BASIN PILLOW	8830	5/01/87	---	13.5	18.5	19.5	WOOD CREEK PILLOW	5960	5/01/87	---	1.2	5.6	9.2
POORMAN CRK PILLOW	5100	5/04/87	---	10.0	16.4	30.4	WRONG CREEK	5700	4/27/87	2	.6	2.0	10.4
POORMAN CREEK	5100	5/04/87	22	10.7	15.8	32.0	WRONG RIDGE	6800	4/27/87	23	8.7	13.0	19.6

Valley Precipitation



Over 130%

110 - 130%

90 - 110%

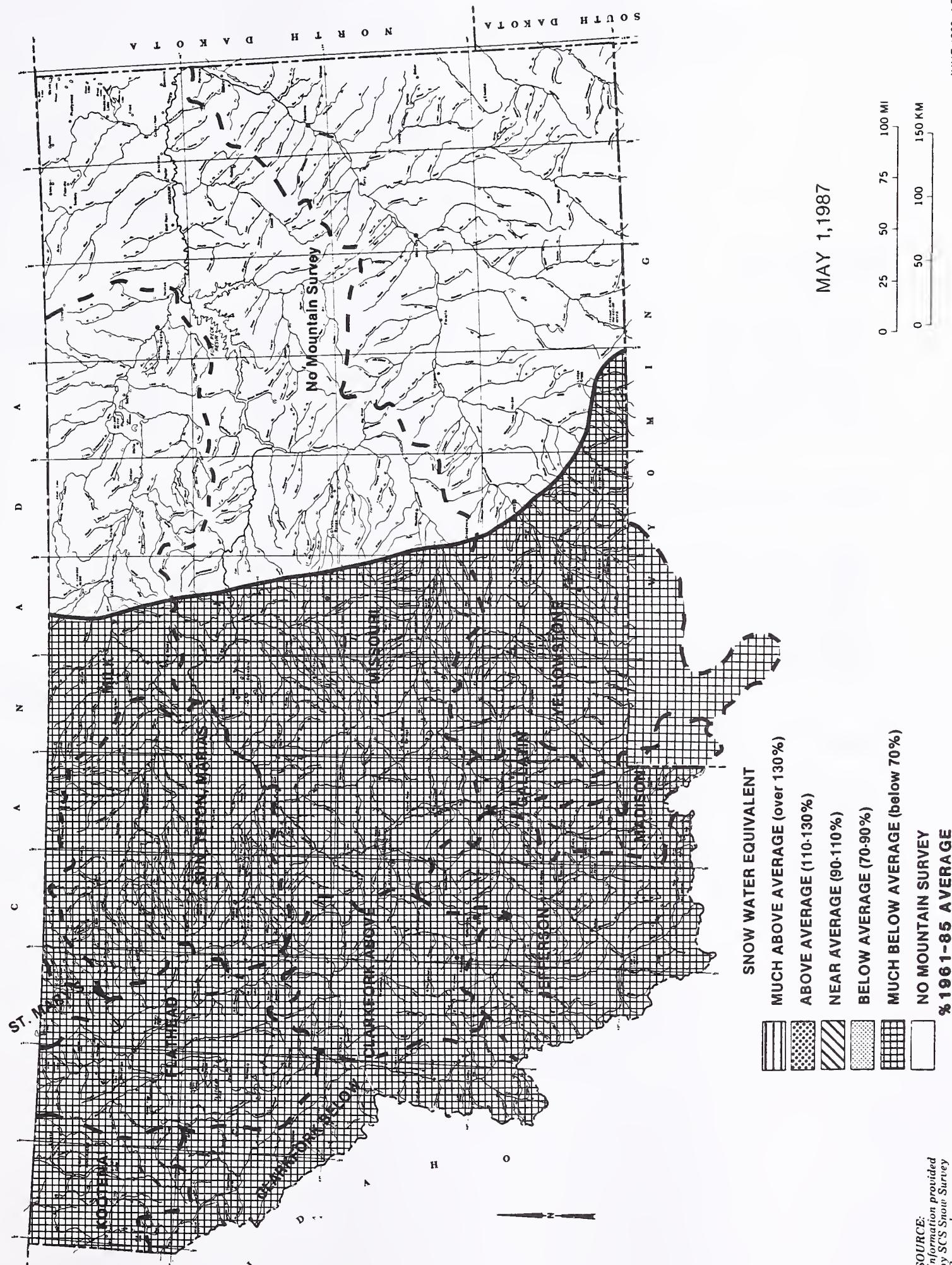
70 - 90%

Under 70%

Source: NWS
Great Falls, MT

APRIL 1987

MOUNTAIN SNOWWATER EQUIVALENT FOR MONTANA



SOURCE:
Information provided
by SCS Snow Survey
Personnel.

ESTIMATES OF PEAK SNOWMELT RUNOFF

	Peak Day Range in cfs	1961-85 Avg cfs
COLUMBIA RIVER		
Blackfoot River near Bonner	3,000 - 6,000	9,588
Clark Fork River above Missoula	5,500 - 11,000	16,738
Bitterroot River near Darby	2,500 - 4,500	6,229
Clark Fork River below Missoula	12,000 - 20,000	31,992
Clark Fork River at St. Regis	15,000 - 26,000	39,984
N. Fk. Flathead near Columbia Falls	11,000 - 17,500	21,189
M. Fk. Flathead near West Glacier	12,500 - 18,500	22,463
MISSOURI RIVER DRAINAGE		
Big Hole River near Melrose	3,000 - 5,500	8,015
Ruby River above Reservoir	450 - 900	1,037
Gallatin River near Gateway	2,300 - 3,200	5,389
Gallatin River near Logan	1,400 - 3,000	5,581
Missouri River at Toston	6,000 - 14,000	19,042
Marias River near Shelby	3,000 - 6,000	11,516
S. Fk. Musselshell above Martinsdale	250 - 400	1,229
YELLOWSTONE RIVER DRAINAGE		
Yellowstone River at Corwin Springs	7,000 - 12,000	17,532
Yellowstone River at Livingston	8,000 - 14,000	20,732
Boulder River near Big Timber	3,000 - 4,500	5,226
Stillwater River near Absarokee	3,000 - 5,500	6,601
Clarks Fork River near Belfry	4,500 - 7,000	7,706
Yellowstone River at Billings	18,000 - 31,000	42,716

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canadian

Department of the Environment
Atmospheric Environment Service
Water Management Service
British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section
Alberta Environment
Technical Services Division

Federal

U.S. Department of Agriculture
Forest Service
U.S. Department of the Army
Corps of Engineers
U.S. Department of Commerce
NOAA, National Weather Service
National Environmental Satellite Service
U.S. Department of the Interior
Bureau of Indian Affairs
Fish and Wildlife Service
Geological Survey
National Park Service
Bureau of Reclamation
U.S. Department of Energy
Bonneville Power Administration

State

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

Private

Big Sky of Montana
Butte Water Company
Confererated Salish & Kootenai Tribes
Flathead Valley Community College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports.

Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

SNOW SURVEY UNIT

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10 East Babcock Street
Bozeman, MT 59715

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